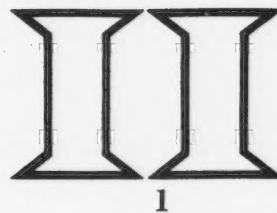


Bind

LIBRARY
UNIVERSITY OF UTAH

JUN 15 1960

SALT LAKE CITY



quarterly publication of

the american museum of natural history

1

Volume II Number 1 1959

CURATOR

A Quarterly Publication of The American Museum of Natural History

CURATOR

Editorial Board

EDWIN H. COLBERT, *Editor-in-Chief*
RUTH TYLER, *Managing Editor*
GORDON R. REEKIE, *Art Editor*
LESTER R. ARONSON
WILLIAM A. BURNS
RUTH NORTON
JOHN R. SAUNDERS
HARRY L. SHAPIRO
LOTHAR P. WITTEBORG

The American Museum of Natural History
New York 24, N.Y.

ALEXANDER M. WHITE, *President*
ALBERT E. PARR, *Director*

II/1 1959

- 5 From Soup Bowls to the Stars:
A Discussion of Museum Public Relations RUTH NORTON
- 11 A New Junior Museum LOUISE CONDIT
- 21 What Price Change? GEORGE W. BUNTON
- 27 The Study of Animal Behavior, Part II T. C. SCHNEIRLA
- 49 Art Museum Publications—
Their Nature and Design RICHARD N. GREGG
- 68 Evaluation of Extension Work with Children JOHN R. SAUNDERS
- 74 Can the Health Museum Flourish in America? WINFIELD G. DOYLE
- 84 On Art Museum Purchases GEORGE J. LEE

CURATOR

CURATOR is published quarterly by The American Museum of Natural History, Central Park West at 79th Street, New York 24, New York. It is a journal of opinion, and the views expressed in its articles are not necessarily those of the Museum.

Address correspondence and manuscripts to the Editor-in-Chief. Manuscripts should be typewritten on one side of the page only, with double spacing, and with ample margins. One carbon copy, in addition to the original manuscript, should be sent to the Editor-in-Chief. The Editorial Board reserves the right to reject manuscripts unsuitable for CURATOR, and to return to authors for revision manuscripts and illustrations which are not in proper finished form for the printer. Captions should be typed on separate sheets. Proof should be corrected immediately on its receipt, and returned with the manuscript to the Managing Editor. Authors should leave forwarding directions if they expect to be away from their regular address. Costs for textual changes made by an author after his article is in proof will be charged to him. Each author may have five free copies of the issue in which his paper is published. Reprints may be had at approximate cost. Reprints must be ordered when the galley proof is returned to the Managing Editor. Illustrations will not be returned except by request. Subscriptions are \$5.00 a year, single copies are \$1.50. Subscriptions in Canada, Newfoundland and all foreign countries are \$5.50. Volume II, No. 1, January, 1959.

From Soup Bowls to the Stars: A Discussion of Museum Public Relations

RUTH NORTON, MANAGER OF PUBLIC RELATIONS
THE AMERICAN MUSEUM OF NATURAL HISTORY

"We're planning an exhibit on soup. Can you tell us where to find all different kinds of soup bowls? Will you help us to set up the exhibit, too?"

"We'd like to borrow a dinosaur for our display window. Can you help us, please? Oh, and we need it right away."

"We're doing a television show on careers for women. Would you happen to have an attractive woman scientist—preferably someone very young and very pretty—who has made a major contribution to science during the past year?"

"We're shooting a movie that has a museum bit. Can we come in with our camera crew early next week? It will take all day—maybe two or three days."

"We're preparing a picture layout on the space age. Can you give us pictures, captions, text, and a lot of information about stars?"

"I'm a journalism student and I hope to go into public relations. Could you tell me what is (or are) museum public relations? What do you do?"

Each of the inquiries mentioned above is a genuine request that has come into this department within recent weeks; each is typical of countless others that we receive regularly by mail, by telephone, by telegraph, or in person, and I venture to say that, with variations, each is familiar to public relations departments in museums across the country.

The youngster who asks, "What do you do in museum public relations?" is a regular customer. We can count on a visit from him, or her, as we can count on the arrival of the autumnal equinox. No sooner do the colleges and universities surrounding us open their doors, than the parade of intent, eager young men and women begins. We welcome them, even though they add to our work, because their questions help to keep us on our course. They help to put into perspective all the other miscellaneous requests that come up continually around the public relations clock.

What, indeed, is public relations in our respective institutions? How are museums and their employees related to the whole concept of public relations? What are some common public relations problems of museums?

Public relations is a flexible term, with as many possible definitions as there are people willing to coin them. In museums, public relations may be described as the process of establishing and maintaining the most effective, harmonious relationship between the museum and the individuals and groups that it serves and looks to for support.

To consider all the public relations problems of museums would require the space of an entire volume of CURATOR or more, not of only one article. Publicity, the basic instrument of public relations, involves questions of proportional budget, press relations, the various uses of media, methods of working with photographers and reporters, and the conduct of press conferences. The space age has brought a whole new set of problems to planetarium publicists. Catastrophe unfortunately may occur in any institution, and the relations of a museum with the press during a time of fire, theft, or any serious accident may have long-term results, good or bad. The close coordination of publicity and public relations efforts with fund-raising and development programs is a matter of vital concern to all institutions that are dependent, in any degree, on public support.

Each of these concerns is important in the public relations programs of museums and will be discussed by specialists in future issues of CURATOR. For the moment, however, I should like to consider just two important aspects of museum public relations. The first is a long-standing concern, as old as museums themselves. The second is one that has been intensified, if not created, by the growth of mass communication.

PUBLIC RELATIONS BEGINS AT HOME

The public relations of any organization begins at home. This is axiomatic, regardless of whether the organization is a museum, a bank, or a supermarket. Anyone who has ever approached an information desk, a teller's window, or a cashier's booth is probably able to recall at least one experience that made a highly favorable impression and one that left a bad taste. Unfortunately, in our era of perpetual motion and minimal grace, the particularly favorable encounter usually leaves one with a feeling of surprise, while the negative impression is accompanied by resigned acceptance.

Museums, steeped as they are in the tradition of public responsibility, have always been conscious of the essential importance of courtesy and helpfulness in dealing with the public. Yet, as organizations not only dealing with but made up of human beings, they may never take for granted this fundamental aspect of public relations. Bearing in mind

the myriad possibilities for errors of omission or commission, I think that it would be useful to discuss the relationship between employees and public.

Each employee is, in effect, a public relations representative. Each has a part in bringing about recognition and understanding of the purposes, programs, and actions of his organization. A conviction about such responsibility has been communicated effectively by many large business organizations to their personnel. One corporation president customarily told his colleagues that he had 1200 public relations people in his company. When they showed surprise, he would point out that, in his opinion, everyone on his payroll was in one sense or another doing public relations.

The Pennsylvania Railroad dramatized this concept in a bulletin to all employees, which read, in part, as follows: "What do we mean by public relations? Public relations is the impression carried away in the mind of every person with whom you talk—by telephone or in person—today."

In a public institution more than anywhere else it is important that each employee keep public relations in mind. A pleasant welcome, a direction given clearly, a telephone call handled promptly and efficiently, all leave positive impressions and may, in fact, bring about any one of a wide range of results, up to and including financial support! Negative reactions may, at the very least, cause the loss of a friend. They may also cause the loss of time and money, even if only in terms of the time that someone must take to answer a letter of complaint. (As someone once said, the smallest file in any organization should be the complaint file.)

Two potentially serious causes for displeasure in a museum visitor are courtesy and the failure of an employee to give adequate and accurate information. One practical step towards minimizing the occurrence of either is to provide for orientation and indoctrination of new employees, and for a continuing flow of clear, cogent information to all employees, especially those who work in public areas or come in contact with the public. This orientation should not be limited to "where to find it" instruction but should serve as an introduction to the museum, including its basic structure, its services, its purposes, and its contributions to society. An employee who is proud of his organization will instinctively communicate this feeling and do a good job of public relations with each contact he makes. Such proper pride, which adds to his own personal dignity, comes to the employee from an understanding and appreciation of the valuable function of the cultural institution in society. But such understanding and appreciation do not appear in the employee automatically with the receipt of his first pay check. This pride, which can do much to enhance the public image of the museum, should be culti-

vated, just as the appreciation of the museum by the general public must be nurtured. And, it is my personal belief, in the process not only will the employing organization benefit, but society at large will benefit, for there is very little that can be more important in the development of a healthy society than the encouragement of a sense of vocation and purpose in each individual.

Many means and media of communication are open to museums in the cultivation of these attitudes: orientation talks by staff members; routine distribution of printed literature, including membership information, annual reports, and general guides to the collection; and the use of bulletin boards and the museum house organ to provide background information about the activities of the institution in addition to news of immediate interest. These are just some of the ways to provide the museum employee with his most helpful asset in dealing with the public—knowledge.

SOUP BOWLS, DINOSAURS, AND STARS

The range of activity of public relations departments is wide and elastic and offers possibilities for many variations in emphasis. From one museum to another, as from one university or industrial organization or social agency to another, there are differences not only in the definition of public relations but in the structures for implementation. Regardless of these differences, however, all museums have certain basic public relations concerns in common, and at the same time each museum has concerns peculiar to its area of specialization, its size, its geographical location, and its point of view.

Harold P. Levy, first Director of Publicity for the National Conference of Social Work, makes this point in his book "Public Relations for Social Agencies." "The way any agency or institution handles its public relations activities is a matter of individual solution. The agency's size and financial position, the complexity (or simplicity) of its program, the skills represented in staff and board, and its general point of view on the subject all count in the determination. Anyone looking for a ready-made formula to be applied like a blueprint on a construction job is almost certain to be disappointed. For there are no over-all public relations formulas to suit every situation; it is a matter of shaping and tailoring to fit."

It is in the area of "shaping and tailoring to fit" that the museum public relations person meets his greatest challenge today. The contemporary museum is no longer a "dead zoo" or a static collection of art masterpieces. By the very fact of its own evolution into a dynamic force in the community it has created an entirely new complex of challenges to those persons who serve as intermediaries between institution and public. When Dr. A. E. Parr, Director of The American Museum of Natural History, said that "the museum is not four walls surrounding a cloistered

life but the heart of a system circulating throughout the world," he implied the existence of a new dimension in public relations. And simultaneously with the change in museums has come the development of mass communication, with a variety of new media and techniques for the dissemination of information and the production of entertainment.

In 1869, when the American Museum was founded, no profession of public relations as such existed in this country. The formal beginning of public relations as a specialization is dated from the turn of the century. Ivy Lee, the man usually credited with being the first public relations counsel in the accepted sense of the term, opened his first office in 1903. Yet the records of The American Museum reveal keen awareness of public relations as early as 1870 and give evidence of the use of publicity, the fundamental instrument of public relations, at that time. A biographical sketch of Charles F. Holder, assistant to the first director of this museum, includes the following notation: "In the early days of the Museum—1871, 2, 3, 4—it was deemed good policy to keep the taxpayers advised of the work being carried on in the Museum, the steps in its evolution, and this was done mainly by Mr. Holder, who not only described the present and future of the Museum in the leading papers of the city, and country, but every collection in the Museum, and every new addition, not once, but many times, spreading the fame of the institution far and wide. The papers—the *Sun*, *Times*, *Post*, *Tribune*, *Graphic*, and others—East and West—were glad to receive this scientific news, and Mr. Holder wrote many articles, long and short, illustrated and otherwise, in this formative period."

Today, museums distribute a wide range of news and feature material about all museum activities to communications media that include magazines; news, feature, and picture syndicates; radio; motion pictures; and television; in addition, of course, to newspapers. They also cooperate in the preparation of articles and books about the museum and in the production of radio and television programs. In addition to initiating the distribution and production of publicity, museums regularly furnish, on request by these media, background information on events in the news, in all the areas of competence of their staff members. Thus, an archeological find, the discovery of a "lost" painting, or the launching of a moon rocket will call forth requests for authoritative comments and interpretation by museum curators. Cooperation on these requests has come to be an accepted function of the museum.

Now, however, museums are being called upon increasingly by communications media and by all sorts of organizations for cooperation in activities apparently unrelated to the purposes of the museum. Calls come from advertising agencies, department stores, banks, and entertainment producers, to name a few groups. Their requests include con-

sultation with curators; permission for the use of museum halls by still photographers, television or motion picture units; the reproduction of museum-owned photographs, slides, and films, and the rental or loan of material from the collections. At times they even ask for objects that are on exhibit, including soup bowls, dinosaurs, or representations of the stars!

Some of the requests that come to the museum may be given prompt disposition, but many of the demands can be neither lightly fulfilled nor lightly dismissed. Often it is difficult, even for the experienced public relations person, to evaluate the demands in terms of time, effort, and cost to the museum, and of any commensurate return. A request that promises effective, dignified publicity for the museum may turn out to have little value, or even to be harmful; conversely, a request that appears to be unrelated to the function of the museum may, in the process of its development, bring the institution credit, prestige, and new friends.

Here, then, is the burning question that we must ask ourselves. How can we balance the fundamental interests of a museum and the demands made upon it by other groups in the community? How can a museum maintain good relations with these groups without disrupting basic research, publication, construction of exhibits, or programs of public instruction? How can a public relations department continue to have happy relations with the rest of the museum without refusing, or drastically adjusting, the requests of the outside organizations? How, in other words, can we keep a museum from losing precious time and money and still fulfill the needs of those who turn to the institution for specialized aid?

Maintaining the balance is of serious concern to museums, especially in metropolitan areas, where there are concentrations of activity in advertising, publishing, television production, and industry. To a lesser degree it may be a concern to all museums, as demands that are relatively new in character present themselves daily.

Today this broadened field of museum activities is walked warily. Each request must be handled thoughtfully in the light of both the resources and needs of the museum. With familiarity, a workable formula should in time be evolved. Procedures for working in and with new media should become as natural and basic as the traditional public relations function of dealing with the printed word.

A New Junior Museum

LOUISE CONDIT, SUPERVISOR OF THE JUNIOR MUSEUM
THE METROPOLITAN MUSEUM OF ART

Following five years of anticipation and planning and two years of actual construction, the new Junior Museum at the Metropolitan Museum of Art opened with a preview for Members' children on October 10, 1957. Occupying 16,000 square feet, an area nearly four times as large as the original Junior Museum established in 1941, the children's center is now situated at the south end of the ground floor. Offices, storerooms, and shops were relocated to make available for public use this desirable space, with a frontage of 176 feet on Fifth Avenue. Served by three entrances, from 80th Street, 81st Street, and the parking lot, the area is eminently accessible as well as conveniently arranged for "after hours" activities.

As in the preceding stages of rebuilding the Metropolitan, this was no mere refurbishing, but a complete reconstruction within the shell of the building. The newly placed walls and acoustic ceilings conceal the maze of conduits, pipes, and ducts necessary to achieve modern lighting, plumbing, high-speed ventilation, and humidity control. In this instance, even the shell of the building presented problems. The architects, Brown, Lawford, and Forbes, had to deal with two floor levels and two ceiling heights, neither of which could be changed because of the cost. They managed so successfully, however, both functionally and aesthetically, that the staff is not inconvenienced in operations and visitors have rarely noticed the variations.

The objective of the architects, the building committee, and the staff was to achieve a spacious, attractive, and efficient center for the reception of children arriving in considerable numbers by bus or on foot for visits of several hours' duration. Besides needing to check their coats and eat their lunches, young visitors would want to be oriented to the Metropolitan, to look at exhibitions of special interest to them, meet their guides at appointed times, assemble for film showings and musical and dramatic

continued on page 20

JUNIOR MUSEUM

THE METROPOLITAN MUSEUM OF ART

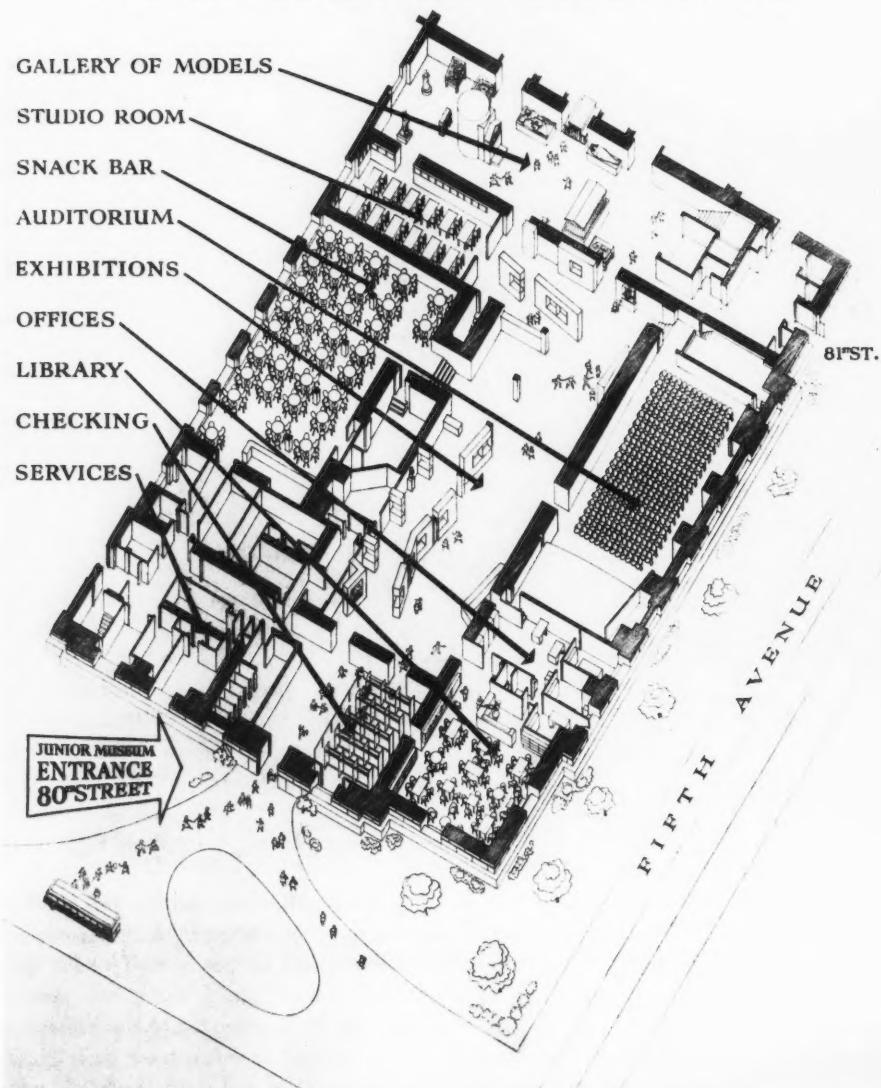


Fig. 1



Fig. 2



Fig. 3



Fig. 4

Fig. 2. A separate entrance just off Fifth Avenue admits children directly to the Junior Museum lobby. Busses discharge their passengers at the door before proceeding to the parking lot beyond.

Figs. 3 and 4. The lobby is equipped with self-service checking racks for coats and parcels, and supermarket carts for box lunches. Wash rooms and registration desk are adjacent. The class or the individual is quickly oriented and ready to pursue the purpose of the day.



Fig. 5



Fig. 6

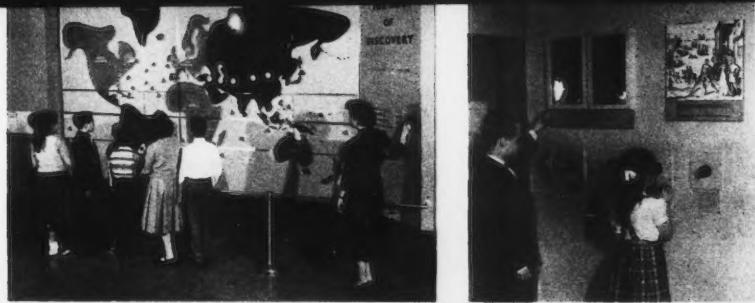


Fig. 7

Fig. 8



Fig. 9

Fig. 10

Figs. 5 and 6. Two views of the centrally located gallery, with modern lighting and low, acoustically treated ceiling, which provides space for changing exhibitions designed and labeled for children. The opening exhibition, "The Age of Discovery, by Caravan and Caravel," included more than a hundred objects from the Museum's collections as well as photographs, maps, and ship models borrowed from other institutions. A new exhibition is to be installed each summer, remaining on view through the school year.

Fig. 7. A large wall map eight feet by thirteen feet was one of the highlights of the opening exhibition. By turning a dial to Marco Polo, Columbus, the Cabots, Vasco da Gama, or Magellan, the child could watch symbols of ships or camels light up in succession to mark the route traveled by the explorer selected. The animation, achieved by the use of vacuum tubes, was remarkably trouble-free despite hard use.

Fig. 8. Fourteen peepholes, ten with 2 by 2 slides and four with 3-D slides, proved endlessly fascinating. Each showed, in color, a scene or an object related to the Museum objects shown nearby. Because many children did not stop to read the written labels, descriptive material for the peepholes in the next exhibition will be recorded and earphones provided.

Fig. 9. Another visitor-participation exhibit appealed to the sense of smell. Cinnamon, pepper, nutmeg, vanilla, and cloves were shown in perforated plastic boxes so the children could sniff as well as see.

Fig. 10. At three locations children were invited to push a button and hear an appropriate musical selection. Here a miniature gamelan orchestra from Burma seemed to be playing. Actually the sound was on tape and was reproduced by means of a message repeater unit.

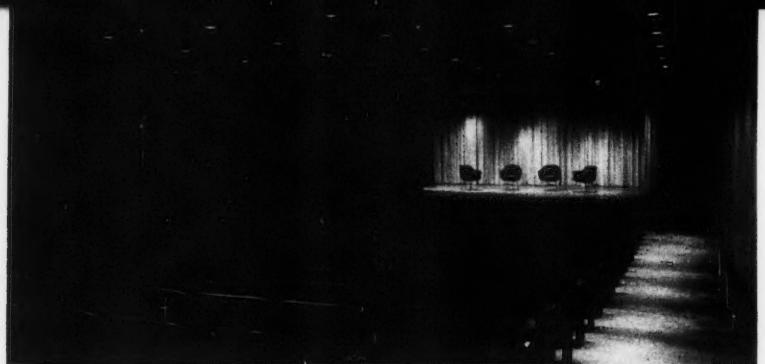


Fig. 11



Fig. 12



Fig. 13

Fig. 11. Adjoining the exhibition area is a handsome, wood-paneled auditorium seating 279. A stage with front and rear curtains and theatrical lighting permits the smooth presentation of puppet shows, music, and dance. Three sections of wall open, accordion fashion, revealing lighted display bays. Here pertinent objects may be assembled and shown as part of an auditorium program.

Figs. 12 and 13. A thoroughly professional projection booth equipped for continuous showing of 16-mm. and 35-mm. films and double projection of 2 by 2, standard, and 3-D slides encourages the use of a wide variety of illustrative material in programs which complement and supplement the Museum collections.

Fig. 14. The Junior Museum library is pleasantly situated, with large windows on Fifth Avenue and Central Park. Gay colors, comfortably upholstered chairs and sofas, an acoustically treated ceiling, and some two thousand carefully selected illustrated books make this a restful and rewarding spot even on the busiest days.

Fig. 15. The new snack bar seating 204 is bursting with activity from its opening to the public at 10 until its closing at 4:45. It is reserved for classes bringing box lunches from 11 to 12:30 each school day. At other hours it is open to all Museum visitors, serving soup, sandwiches, grilled items, fountain specialties and other beverages, and desserts. With five windows on Central Park framing views of the landscaping newly completed by Olmsted Brothers of Boston, with contrasting walls of persimmon and blue, stainless steel counter, columns, and trim, and molded plastic chairs in six colors, the new snack bar is light, airy, and gay.

II/1 1959



Fig. 14



Fig. 15



Fig. 16



Fig. 17

Figs. 16 and 17. Contributing to the flexibility as well as to the variety and scope of possible activities is the studio, a self-contained, multi-purpose room equipped with display panels, storage units, stainless steel sinks, tables and chairs, a projection screen, and stereopticons. Here changing exhibitions of children's work can be attractively and easily displayed. Here are held Saturday studio hours for Members' children. Here school groups sit down and pass around "real" objects that may be touched.

Fig. 18. The sales desk, located in the exhibition gallery near the auditorium entrance, offers post cards, color prints, picture sets, maps, and books about art and archeology, as well as a few unusual toys and models related to the collections. The Junior Museum staff prepared for Museum publication several souvenir items related to the age of discovery—two new subjects in the school picture-set series, two ship stickers, one of them a bookplate, a crossword puzzle in the form of a caravel, and a perpetual calendar derived from the astrolabe.

Fig. 19. Fifth graders are picking up rubber mats which they will sit on during their gallery tour with Miss Whitney, a Junior Museum lecturer. Gallery tours are conducted to all parts of the Museum. The American Wing, the Egyptian collection, and the Armor Hall are perennial favorites. Another class is about to enter the snack bar.

Fig. 20. Not actually part of the new Junior Museum, but adjoining it and planned with children's interests in mind, is the gallery of models, now nearing completion. Architectural models of ancient Egyptian, Greek, and Roman buildings are shown, along with casts of associated masterpieces of sculpture. For example, on the wall behind the Museum's popular model of the Parthenon, newly restored and repainted, is a full-scale cast of a section of the procession from the Parthenon frieze, while on a pedestal nearby is a cast of a horse's head from the eastern pediment.

II/1 1959



Fig. 18



Fig. 19



Fig. 20

programs, rest, ask questions and look up information, buy souvenirs, and on occasion draw or paint. Parents would want to inquire about facilities, procedures, and forthcoming events, and teachers would need ready access to an appointments office. The staff would require generous office, storage, and work space for the mounting of special exhibitions, as well as the preparation of costumes and props for special occasions.

How the space was handled to provide for these various needs is shown in the illustrations that precede. What unfortunately cannot be illustrated here is the generous use of color and the emphasis on comfort in the furnishings. Both of these features have been enthusiastically noted by the children who almost always whistle when they first see each room and write bread-and-butter notes in which they invariably mention "the comfortable chairs." They are referring to molded plastic chairs in six colors in the snack bar, auditorium seats upholstered in blue Naugahyde, and library chairs padded with foam rubber and covered with red Sarano, a synthetic washable fabric resembling wool.

The new Junior Museum was made possible by the James Foundation's generous gift of \$250,000 in 1951. Designed especially for children of elementary and junior high school age, it can comfortably accommodate 200,000 children a year.

What Price Change?

GEORGE W. BUNTON, MANAGER
THE ALEXANDER F. MORRISON PLANETARIUM
CALIFORNIA ACADEMY OF SCIENCES

Probably in no phase of human culture is the description of the present period as an era of change more appropriate than in astronomy, physics, and related fields. Several entirely new ideas of the nature and the evolution of the stars have come upon the heels of man's discovery and development of atomic energy. The radio telescope has provided a new and powerful technique for the study of the universe, while the most ambitious project of all is about to send man in person on his grandest adventure, the exploration of the nearer astronomical bodies.

The science museum, and the planetarium in particular, in keeping faith with an obligation to interpret science for the layman, is hard-pressed to keep up with these changing times. Such rapid and spectacular developments have great appeal to the imagination of the current generation, and the problem of balance, more insistent than ever, plagues the museum and planetarium executive. There is a vast array of scientific accomplishments of earlier periods which is of fundamental importance, and the administrator is faced with the question of how to apportion space and time between the old and the new.

In the planetarium business, success has come to be measured in terms of attendance. The pressure upon the planetarium executive to keep up the attendance prompts him to cater to the interests of the public. Furthermore, a degree of competition has developed which causes the executive some concern when attendance shows more improvement in some other institution than in his own. Competition on such a mercenary level is something new among museums.

The planetarium itself is new. It has been on the American scene for less than thirty years. Even in so short a time there has been a marked

change in planetarium programming. With the first American installation of the Zeiss instrument at Adler Planetarium in Chicago in 1930, there were introduced with the instrument, almost as a ritual, the ideas of programming and presentation that had originated in Europe. The atmosphere of solemn dignity within the planetarium theater and the scholarly delivery of the lecture by the "Herr Professor" were to some extent imported with the instrument.

Fortunately, the Yankee informality, for which the European chides us, would not permit such attitudes to survive here. The European influence diminished rapidly when the Century of Progress Exposition opened in 1933. It is probable that the carnival spirit of the Fair influenced the staff to some extent and saved the American planetarium presentation from becoming "stuffy culture" as found in some of the European planetaria. In a report to the planetarium executives of this country, A. F. Jenzano, manager of the Morehead Planetarium in Chapel Hill, North Carolina, mentions that at least two of the planetaria he visited in Europe were on a very limited schedule and their shows were "strictly astronomical." This phrase has a special meaning to planetarium people in this country. Certainly a demonstration in a planetarium must be of an astronomical nature. The heavens are portrayed and the whole environment is set for a drama of the sky, but "strictly astronomical" has come to mean "science without excitement," "education without entertainment," "food without spice." It is the philosophy of most of the American planetarium people today that science *can* be exciting, that education *can* be attained through entertainment, and everyone agrees that food without spice is scarcely palatable. A comparison of public response here and abroad testifies to the wisdom of the American policy of planetarium programming.

In 1933, Fels Planetarium was installed as a part of the Franklin Institute in Philadelphia, and in 1935 Griffith in Los Angeles and Hayden in New York opened their doors. Administrative personnel were in demand and could best be recruited from the staff at Adler.

The men who went to the new planetaria were influenced by their association with Philip Fox, the first director of the Adler Planetarium, and they carried with them some of the policies that had been created at Adler. But that first staff at Adler consisted of men of outstanding ability and of strong personalities. Gradually their own ideas took root and blossomed, and policies in the different institutions diverged considerably. Some remained most conservative, while others took a progressive tack that was regarded as radical and even disgraceful by the conservatives.

Part of the so-called sensationalism engaged in by some of the planetaria developed from the economic policies imposed by the parent institutions. The planetarium in Chicago was such a gratifying success that

a feeling arose that this sort of interest could be capitalized upon, and, as a specialized form of entertainment, that the planetarium could logically be a source of revenue for the museum or parent institution. To some degree, pressures were applied to put the planetarium on a paying basis. There was no difficulty in attracting large attendance in the days when the planetarium was new, but when installations were made in other cities, the general excitement diminished and attendance dropped. It was natural for those in responsible positions to seek ways to boost the attendance.

During the war years, the five major planetaria then existing in the United States devoted much of their efforts towards the training of Armed Services personnel in the fields of navigation, star identification, and orientation by the stars and sun. The staffs of most of the institutions were reduced during those years, but a transition was taking place that was to have a strong influence upon the planetarium. The war placed urgent emphasis upon technology. The layman was introduced to aspects of science and technology of which he had never dreamed. With the instantaneous destruction of Hiroshima, atomic energy became a reality to the layman. The German V-2 weapon program gave the man in the street his first hint that space travel was not confined to the dreams of the science fiction writer.

The post-war years found the planetaria throughout the country enjoying revived attention from the public. These institutions quickly took advantage of the interest the layman had found in science. At Griffith Observatory and Planetarium in Los Angeles, the institution with which the writer was then associated, special projection equipment was developed to present a type of show which was a major innovation at that institution. Griffith had been considered quite conservative in its programming throughout all the years of its existence. The new type of show was a simulation of space travel—an exciting experience for the spectator. Equipment for the space travel shows was elaborated upon through the years, until it now represents an investment of the same order of magnitude as that in the Zeiss projector itself. While the idea was not new and had been made use of in some of the other planetaria, none had invested so much time or money or had developed such elaborate optical devices. Needless to say, the attendance at the new shows was excellent.

The spectacular planetarium show created a new problem. It is the problem foreseen by the country pastor who said he never preached an outstanding sermon because his congregation would then expect it every Sunday. The planetarium now must please a sophisticated patronage made up of people who have learned that some shows are better than others. They watch the schedule of the planetarium and respond to those shows that promise something exciting or colorful. The planetarium ex-

ecutive can now predict with some accuracy what the attendance will be while a show of a certain title is being presented. In San Francisco we have found that titles themselves are important. The public reacts best to titles including such words as "space," "moon," "rocket," "aurora," and "Mars."

Most planetaria change their shows at intervals of about a month. This policy is less rigid in some institutions where the program is changed at intervals decided upon by the administration on the basis of importance and box office value. In the two California planetaria, the summer tourist season is considered, and a "spectacular" show is presented for two or three months without change. None of the other institutions enjoys quite the large seasonal influx of tourists that is found in San Francisco and Los Angeles, although certain seasons are better than others in all planetaria.

While the old idea, dating from the early days at Adler, of presenting the same show for the same month year after year has been abandoned, the versatility of the planetarium projector is not unlimited, and there is a limit, as well, upon the number of subjects that are appropriate for the layman. In addition, not all phases of astronomy lend themselves to suitable illustration within the planetarium theater. It has been generally assumed that the audience has come to the planetarium to see the stars, and, therefore, the star projector should be used as much as possible. This notion has been challenged, perhaps unconsciously, by most of the planetaria. Some shows have been presented which made little use of the main instrument, the starry sky being displayed for only a very few minutes. Some of the shows involve the use of special effects which replace the stars. A space travel show, for instance, can be accomplished without much use of the stars except to set the stage for the drama of approaching and landing upon some astronomical body other than the earth.

The planetarium executive is placed on the horns of a dilemma. He is under pressure on one hand to provide a diversified program that will keep the patronage from drifting away, and he is restricted on the other hand by the limitations of the equipment, the capacity of the audience to assimilate, and the type of presentation that is adaptable to the planetarium theater. More than ever, as transportation becomes easier and more rapid, and as more planetarium installations are made, the executive is faced with competition from the other planetaria. He finds himself striving to keep up with the Joneses. He is torn between extremes of policy in the presentation of his shows. There is a great appeal in the dramatic, "science fiction" type of presentation, which, it must be admitted, can be made to carry a message; and then there is, or should be, a sense of obligation to keep the presentations on a high scholarly level.

in keeping with the aims of the institution. It is of no help to him to realize that the spectacular, space travel show may be made far more convincing, if not so learned, by a movie company with a hundred times the annual budget of the planetarium. He is equally depressed by the thought of the planetarium's becoming a lecture hall to be frequented only by scholars. Whichever alternative he chooses, he is still plagued by critics and pressure to choose otherwise.

The constant search for something new can become a burden. The writer finds it embarrassing when the lecturers being briefed on the new show ask, "Isn't there anything new?" The development of new devices is a costly and time-consuming job, and some of the planetaria are not equipped with sufficient shop facilities for the development of anything very elaborate. Ideas for new equipment are occasionally forthcoming, but often they are impractical, too expensive, or too late.

In recent years, the atmosphere of competition has been modified in two directions, probably brought about by the same stimulus. The Spitz Laboratories, headed by a man of considerable planetarium experience, developed a small planetarium for use in classrooms or small-dome structures of classroom proportions. The idea caught on, and at the present writing, more than a hundred of these instruments are in use throughout the world as teaching aids. In some places, the Spitz instrument is employed for public shows in much the same manner as are the larger instruments. No one makes any claim that these smaller instruments offer any competition to the major installations. However, there is a stimulus to the major planetarium that arises from the existence of the lesser ones. Executives at the larger planetaria, affected by this stimulus, feel they must maintain the superiority of the major installation by exceeding the capabilities of the classroom instrument as far as possible. It may have been the introduction of the Spitz instrument that prompted the men of the major institutions to establish an annual executives' conference to compare notes and exchange ideas among themselves. This interchange has been going on for several years and great benefits have been derived from it.

At the present time, a Spitz instrument of major proportions is being installed in the Longway Planetarium in Flint, Michigan. Another will soon be installed at the United States Air Force Academy in Colorado Springs, Colorado. Another instrument, which has been under construction for several years, is nearly ready for operation at the Museum of Science in Boston, Massachusetts. The major funds for the construction of this instrument came from the Hayden family, so that it bears the same name as the planetarium at The American Museum of Natural History in New York. This instrument, of remarkable intricacy, was designed and built by the Korkosz brothers of Springfield, Massachusetts.

Although the appearance of more planetaria has resulted in increased competition, it has also led to closer collaboration and cooperation among those affected. Thus the stage is becoming crowded, and the actors who have so long been starred are being reduced in importance.

While an atmosphere of competition usually is regarded as a healthy one, it can impair the vision of the planetarium executive if he loses sight of the basic aims of his institution. He will do well to reappraise the relationship between the planetarium and the parent institution, with the idea of verifying his own concepts. This reappraisal should be frequent. It is easy to be swayed one way or another by various exigencies, and he may drift far off course without realizing it. A basic question he can ask himself is, "What is my job?"

The planetarium is a medium through which a great audience is reached. It can be more effective in reaching the people than all the rest of the museum. Members of the planetarium audience sit in rapt attention, while the museum visitor may stroll listlessly through the exhibit areas and gain little from his visit. The planetarium executive can ask himself, "Am I living up to my obligation to the parent institution in the material that is presented in the planetarium, and in the impression that is given to the audience?" The attitude of the public is synonymous with the reputation of the institution.

A thorough understanding should exist between the executive and the policy-making board or individual as to what is expected of the planetarium, and as to how much importance is placed upon revenue.

In possession of the answers to these questions, the executive can approach the problem of programming policy with assurance that he knows where the safe ground lies.

The Study of Animal Behavior: Its History and Relation to the Museum. II

T. C. SCHNEIRLA, CURATOR

DEPARTMENT OF ANIMAL BEHAVIOR
THE AMERICAN MUSEUM OF NATURAL HISTORY

Research in a modern museum of natural history is distinguished by its evolutionary approach to nature, covering the entire range of adjustments to natural situations. Here the study of behavior can play an important role, not only in scientific evidence and theory, but also as one means of linking the research aspect of the museum program with exhibition and education.

A department devoted to the investigation of problems in animal behavior can be helpful in other ways as an integrative agency in the museum's program. Such a department facilitates the correlation of research and theory about animal functions, through its emphasis on the organism as a unitary, organized system coping with its world. For in the course of life the animal may often need its entire resources—whatever the species limits of structural, physiological, and psychological capacities—to meet the emergencies of its habitat.

The activities of each distinctive type of existing animal are mainly, by hypothesis, adaptive, adjusting the species to the conditions of its particular environmental niche. Accordingly, the program of a museum department of behavior is directed first of all at the study of adaptive behavior and its biological basis in the important types of animals. To be sure, in this day in natural science, particularly in America, emphasis often falls on the study of adaptive functions in particular animals as specialized subjects; thus, geneticists have used the fruit fly, physiologists the dog, and psychologists the white rat, as a common lower-animal subject. Even in behavior research itself, at the present time, the evolu-

tionary approach is often passed over for the study of the activities of different animals in terms such as shelter-getting, food-getting, social, imitative, reproductive, and other general classes of adjustments. In the museum, however, such procedures should be carried out by a comparison of the major types of animals with respect to these adaptations.

In a natural history museum, behavior study is inherently phyletic and comparative in its major emphasis. In research on the principal types of behavior, methods for studying common properties can be planned so as to work out general principles that hold for all phyla, and, at the same time, to assay important differences among animals. Thus, although the aspect of stereotypy among individuals is prominent in the food-getting and other behavior of lower invertebrates such as the starfish, and appears strikingly in the behavior of insects, it now takes on different and far more complex forms, as is also the case, but still differently, in birds. In the mammals, in contrast, plasticity and change characterize normal species behavior, and stereotypy becomes an exceptional, eccentric feature. Probably adaptive behavior can be understood best in terms of how it is very differently achieved in contrasting animal types. The postulation of qualitatively different levels in various animal phyla and in the classes of vertebrates seems a sound guide for the study of behavior.

The direct investigation of behavior, of course, involves living animals. Even when these are accessible to investigation in museum laboratories and not only in the field, studying their behavior and its biological basis demands evidence from many scientific sources. Thus, a combination of research on the anatomy, physiology, ecology, and behavior of living echinoderms in comparison with those of living insects sheds light not only on modern conditions but also on the circumstances of ancient times and ancestral forms and on the evolution of adaptive functions in general. Projects thus organized in a museum program may thereby serve as means for comparing the relative efficiency and durability of behavior patterns in existing animals with those of ancestral forms. One can imagine a ghostly clinic of the extinct, in which representatives of trilobites, mastodons, and sabre-tooth tigers discuss the question: "Was it something we grew, ate, or did wrong?" For enlightenment on such

Fig. 1. Routine procedures in maintaining fish for laboratory experimentation. The commodious greenhouse on the seventh floor of the African Wing of the Museum houses the large tanks and furnishes the ecological conditions necessary for behavior studies of fish such as the West African mouthbreeder. In nature, this fish lives in shallow coastal lagoons, river deltas, and other situations where long daily periods of exposure to tropical sunlight prevail.

II/1 1959



problems we may look to comparative psychology as well as to anatomy, physiology, and ecology. In the museum, therefore, behavior can be studied to advantage in terms of both its different phyletic settings and its underlying biological and psychological processes.

Linkage of present and past is through heredity in all organisms, often also with mechanisms resembling the "traditions" of higher organisms, via the developmental medium. Students of systematics and animal classification, orienting their theories progressively in terms of a coalescence of structure and function, now give behavior more weight than ever before. Emphasis on behavior in systematics has brought with it a strong tendency to view species-typical systems as strictly inherited, and, in view of correlations observed between species structure and characteristic responses, the conclusion is often drawn that behavior patterns may be considered homologous, much as structures of common ancestry are considered homologous. This answer, however, to what for museum scientists is a key question, is not necessarily correct. For, although heredity may be considered basic to all behavior in all animals, genetic mechanisms may underlie behavior very differently in different types of animals, according to how the non-genetic factors intervene and what these may be in the various cases. That is to say, no direct, closed relationship can be presumed to link genes, structures, and behavior in any species, and structures may mediate very differently between genes and the activity systems of Protozoa, pigeons, and primates (11).¹

Consequently, the problem of "instinctive behavior," that is, of species-typical behavior considered in the light of underlying hereditary mechanisms, is a focal one for study in a natural history museum. On the thesis that the term "instinct" merely raises the general problem of behavior ancestry in animals but offers no clear, valid solution, the program of our own department centers around the question of how behavior patterns characteristic of species develop in different phyla and classes. Under museum auspices, two important avenues of research are open for such a program.

The union of laboratory and field research traditionally is best achieved through the facilities of a natural history museum. In the program for behavior, the emphasis ideally is on a close relationship between studies of species under controlled conditions in the laboratory and of the same or related species in their natural situations. But, as the history of animal psychology shows, coordinated field and laboratory investigations of behavior are difficult to carry through, except on a limited, sporadic basis, because of inevitable handicaps in techniques, personnel, time,

¹ The numbers in parentheses throughout the present article refer to items numerically listed in the Bibliography.

II/1 1959

and funds. The handicaps are not mainly in obtaining the funds, for progress seems to depend first of all on advances in techniques and methods and on improvements in planning related to the sharpening of goals as theoretical insights are clarified.

One important aspect of planning concerns what animal is to be studied. The selection, presumably, should be guided first of all by considerations of theory and method and by an interest in comparative research. These are severe criteria, it seems, for they oppose the common preference for domesticated species for psychological and other research. Domesticated animals, such as the pigeon and the white rat, are in wide use, no doubt more because they are relatively cheap to obtain and to maintain in numbers and adapt well to a variety of laboratory situations, than because they are the best animals for the study of many problems. That the transferral of a species sample to the laboratory from nature is hardly ever a simple matter and the maintenance of sufficient numbers for research often may be very difficult are no excuse for our letting the course of science be dominated by conditions of mere convenience in subject matter. To free themselves from such stereotypy, scientists must pursue energetically the answers to problems, from health and breeding techniques to laboratory habituation and research use, that now oppose systematic scientific study of species from the wild. As the need for coordinated field and laboratory research is more widely recognized, solutions to these problems should be found for an increasing variety of animal forms.

Comparative investigation of the behavior and psychology of animals should advance best in well-organized programs of field and laboratory investigation of common problems. With good planning, field and laboratory approaches may be combined advantageously (e.g., 7). Progress should accelerate and broaden as the realization spreads that these approaches to animal study actually are closely related (10). Experience has shown that field study is not just a matter of "watching the animal" and jotting down notes, for if systematically pursued it must solve problems of method and attack problems of theory closely allied with those of laboratory research. Even a general observation, uncomplicated by gadgets or special procedures, represents an intrusion into the animal's world and a distortion of the phenomenon under study. To control such factors, and to develop adequate methods of analysis, techniques for entering the situation and for mastering the details of perception and record-taking at successive stages must be worked out and procedures for analyzing results must be developed that are appropriate to the animal, situation of the study, and the problem. For, in principle, there is a close equivalence between laboratory and field research on behavior, as concerns the logic of controls, adequate design, a sufficient

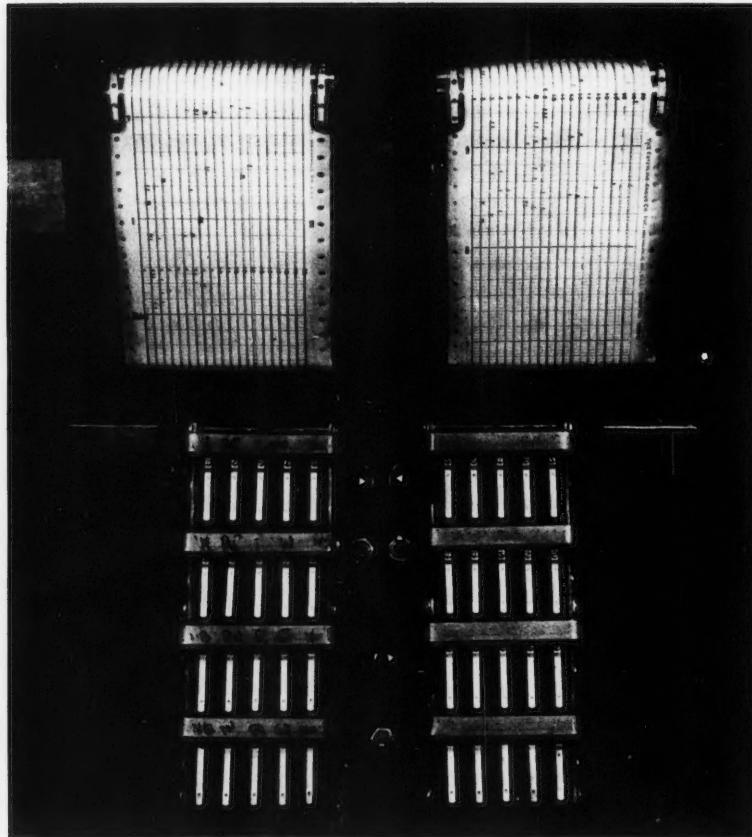


Fig. 2

Fig. 2. Electro-mechanical recording system used in the laboratory of the Department of Animal Behavior. The observer operates the keys on the board "by touch," without taking his eyes off the animal. Each key stands for a different item of behavior, and pressing the respective keys controls electrically the movement of corresponding pens tracing lines on the moving paper roll of the recorder. In this manner, a graphic record of the animal's behavior is obtained. Fig. 3 illustrates the use of this system.

Fig. 3. Routine observations preliminary to an investigation of environmental factors affecting behavioral development in mammals. Female rodents with litters live in cages of a design under study for possible experimental use. Daily records of their behavior are taken with the apparatus shown in Fig. 2, with dictaphone for qualitative notes.

number of cases, and systematic organization of results. With increasing experience, field investigations increase in reliability and resemble experiments more, and laboratory research becomes more naturalistic and better adapted to the animal under study, than when field and laboratory are regarded as largely disconnected or just mutually supplementary.

In this type of approach to problems, facilitated in the museum situation, the behavioral investigation of any species can advance by regular stages. The first stage aims at obtaining information both about the behavior pattern and about the animal's typical adjustment to laboratory conditions, viewed in relation to behavior under natural conditions. This may be an introductory probing of the problem, or a "pilot phase," in which the behavior repertoire of the species is charted and the nature and circumstances of occurrence of the chief items in this repertoire are explored.

The pilot stage can guide the planning of an intensive, better-controlled investigation. In our laboratory, from the empirical evidence obtained in the first stage, tentative lists are made up of behavior items according to their evident importance, for use in more systematic studies. A mechanical means has been devised by which frequencies, durations, and combinations of the acts can be recorded by a trained observer who "keeps his eyes glued to the animal" (Figs. 2 and 3). By such means we have worked out methods for the analytical investigation of behavior in several vertebrate species.

Methods of this kind can involve operations of synthesis as well as of analysis, in that the experienced observer may concentrate in one series on particular aspects of the behavior and in the next on a perceptual survey of the pattern as a whole. When carried out successively, these operations facilitate each other—giving evidence about both the woods

Fig. 3



and the trees, so to speak. In field investigation, method should result in ideas for special tests as supplemental to observation; in laboratory research, it should produce hypotheses to be tested in specific experiments.

In the program of our department, the first goal is to gain evidence both on the development and the adult pattern of behavior in each of several important animal types, to assay the species-typical behavior system of each. The next step is to devise methods for discerning the similarities and differences of species patterns in comparison with those of closely and of distantly related animal types. As the following perspective will show, in terms of some representative studies, we have concentrated on the first stage and, up to the present time, have entered the second only in an exploratory way.

Investigating a species behavior pattern as an adaptive system calls for studies of its repertoire of items, its psychology, its biological basis, and its environmental relationships. Much of our research has been directed at species reproductive behavior, as critical for species survival and therefore as a strategic means of our understanding the inclusive behavior of the animal. Studies of reproductive behavior in species of the West African mouthbreeding fish *Tilapia* began with observations of adults engaged in nest-building, mating, and incubation. Specialized studies followed. On the biological side, certain important differences were found between these fish and mammals with respect to the role of ovarian hormones. Evidence was also found on the function of social stimulation in spawning and on the influence of early experience in the ontogeny of mating behavior (2, 3). In another series of studies, the reproductive behavior of the marine goby fish was analyzed (15). Depending on the combinations, certain visual, chemical, and other stimuli could elicit combat, courtship, or territorial defense from the male. A female ovarian secretion was found, excitatory to the male. Sounds were also involved, and it was discovered, for example, that a peculiar "grunting" noise emitted by the male could be distinctly excitatory to females (16).

In our research, emphasis is placed first on analyzing the behavior and discovering underlying factors, then on studying interrelationships of processes involved in the species system. Research on species of army ants in field and laboratory has revealed a complex pattern of cyclic behavior in which phases of vigorous predation and nomadism alternate with relatively quiescent phases in the colonies (12). The key relationship proves to be an increased "social stimulation" of the worker population at specific intervals by the active stages of successive immense broods, which accounts for the regular intervention of "nomadic" phases between successive "statary" phases. Also critical to this system are changes in the stimulative action of the larval brood on the colony at

specific (histologically identifiable) stages, so altering adult behavior as to set off through various channels a critical change in the queen's reproductive processes. In the army-ant behavior pattern and its species variants, many different agencies are involved, some deriving from the properties of each different type of individual in the colony (i.e., from queen, broods, and workers), others from specific environmental influences such as the day and night cycle.

Studies of reproductive patterns in mammals have been focused in detail on the role of hormones in behavior organization. An important class difference is indicated here. In mammals low in the scale, such as rats, castration results in an early disappearance of the male pattern; in certain higher mammals (including man), however, the male sex responses often persist for a long time after castration. Experiments both on hamsters and domestic cats ruled out a replacement hormone from the adrenal gland as cause, although replacement tests revealed hormone relationships. Male cats, however, given appropriate experience prior to castration, continued sexually responsive for several months after the operation, whereas males without such experience lost function quickly (8). The results tend to support Beach's thesis that the role of experience in the sexual sphere is significantly greater in the higher mammals than in rodents.

Widely indispensable to reproduction in the vertebrates are parental relations with young, which are typical of the species. Such behavior is often attributed to specific hormones presumed to arouse it by priming an innate neural control. Results from the mouthbreeding fish, mentioned above, indicate that this hypothesis may be too simple or even misleading, as do also findings concerning the ring-neck dove (6). In this bird, both parents normally feed the young by regurgitating "pigeon's milk" from the crop. The act seems automatic and explicable on the above basis. Experiments showed, however, that whereas injections of the pituitary hormone, prolactin, caused the crop substance to be produced, parent doves did not deliver this to the young unless they had experienced certain stimulus-response relations with the young in the early nesting stage. Prolactin does not arouse feeding of young directly; its effect rather involves both a suppression of mating responses and arousal of organic changes underlying production of the crop substance and crop engorgement, and hence contributes partially and indirectly to the act. From such changes, however, two among several essential events, the opening of the parent's bill and regurgitation from the crop, can occur in turn as the sensitive parental thorax is stimulated incidentally by hungry nestlings in stirring about. Beyond the organic factors, therefore, the parental-young exchanges of stimuli and response on the nest seem essential to the rise and integration of the feeding pattern.

Our studies with domestic cats, which involve both analyses of normal behavior and experiments in which kittens are isolated for subsequent tests, support the following account of the normal feeding relationship (9). After the litter has been delivered, the female initiates nursing by approaching and licking the neonate kittens, then lying down and enclosing them in an arc. Each new-born kitten, thus aroused to activity in its turn, moves towards the female's abdomen, as into a commodious enclosure, slowly and with infinite obtuseness from the observer's view, but in effect guided, over all, by gradients in thermal and tactal stimuli from the female—"the closer, the warmer," as it were. On touching the warm, hairy surface, the kitten gives the crude, variable response of nuzzling, so that through many different occurrences its sensitive nose finally meets, fumbles about, and at last secures, a nipple. We find that from the first hour the kittens improve in their ability to reach the mother and to attach after separation. What is more, they also improve in reaching and suckling at individually specific nipples—one fore, another aft, and so on. To all of these matters the female's presence and movements contribute, as factors in a progressive, reciprocal process.

In these very different cases of species-typical behavior in invertebrates, the patterns seem to develop as complexes in which the roles of organic structures and functions, with those of stimulation from the situation of development, are interrelated very intimately. In the parental-young system of the cat, however, individual developmental plasticity and the role of learning seem to assume a much greater weight, and to figure very differently, than in the insects and lower vertebrates studied.

In the museum research environment, stress is both on the problem of origins and on that of animal nature, consistent with the relevance of behavior to systematics, evolution, and environmental adaptations. As regards the question of how species heredity influences the development of species-typical behavior, emphasis on developmental processes avoids both the barren issue of "nature vs. nurture" and other blind alleys, such as the sharp cleavage of "instinct" from "intelligence." Prospects are that both these distinctions will come to be held as relative; at any rate, at present neither behavior development nor learning in any of its forms is sufficiently known to support them. Rather, our thesis is that in various phyla and classes of animals structure and function may interact and influence ontogeny in many different ways and may enter into very different relations with the developmental situation (11).

The bearing of the life situation on development demands a close investigation in all animals, for *experience*, defined objectively as "the effect of stimulation on the organism," always plays a part in species development. In the agencies of developmental experience at various animal levels, general similarities are indicated as well as differences.

In the cyclic functional system of army ants, interactions with the prevalent situation evidently condition the emergence of individual social function in a manner characteristic of the insect (11, 12). Because, for example, the feeding of individuals as larvae and later as newly emerged adults occurs in an odor field typical of the colony as well as of the species, these specific interactions of the developing worker with its situation seem to contribute in essential ways to the rise of normal adult responses such as trail following. Observations and tests show that young workers, after emerging from their cocoons, exhibit the normal behavior of adults only after a preliminary phase lasting a few days, in which time their crude initial responses evidently are modified into reactions such as the efficient laying down and following of chemical trails, discrimination of strangers from nest mates, and other adult responses integral to the colony behavior system. Callow workers released artificially from their cocoons and raised in the laboratory apart from nest mates are slow and defective in their responses after a few days, as compared with normal young. The conclusion, supported by other evidence in the army ant and certain other social insects, is that species behavior in these cases does not appear as a purely "inborn" pattern.

Because reproductive behavior is critical for species survival, museum research and theory require that its development in individuals be appraised accurately. Laboratory findings (14), referred to below, indicate that even in the lower vertebrates patterns such as mating are not organized independently of the situation of development. Experiments on parental behavior in birds (6), also, as described, reveal that intricate relationships often exist within a cluster of organic and experiential factors essential to the normal development of such behavior. The point here is definitely not that such behavior in any species is due to "learning" rather than to "instinct," for these are false alternatives. "Experience," as we define the term, is not always equivalent to learning, although, depending on species capacities, it may involve one or another form of learning. This point is supported by evidence on parental behavior in cats, already mentioned, in still other ways.

Investigations of delivery in the cat indicate that this act is not natively organized in that the female automatically "knows what to do" (18). Rather, she possesses certain organic processes which promote a successful birth, provided that indispensable interactions of factors in organism, behavior, and situation become possible. Experiments with rats indicate that such processes begin early in life and include experience of the female with her own body and the genital areas particularly. Organic factors involved in the birth episode are uterine contractions, birth fluids, after-birth and expelled membranes, and the neonate itself. Each of these in its turn exerts potent, incidentally directive stimulative effects

on the female's behavior. Quantitative and qualitative studies of many parturitions show, for example, that the processes of licking the attractive fluids exert an over-all integrative influence by shifting the female's attention from one aspect to another in the changing situation, as from her own body first to the substratum and then to the neonate. Events are consequently so channeled that a reciprocal stimulative relationship between female and neonate starts and progresses into a suckling-nursing pattern, and thus a social bond can develop along psychological lines in the litter situation. The female's pattern of behavior in parturition thus is not preformed but is literally assembled in the delivery situation itself.

The idea still is widely held that activities appearing in an organism raised away from species mates (i.e., in "isolation") must *ipso facto* be "inborn" or "innate." Isolation of young from the species is a useful method for studying behavior, and we have employed it, but not with its traditional interpretation. Our policy is rather to examine the relation of structure and function to the changing developmental situation in successive stages of development. As one example, platyfish reared from birth to sexual maturity away from species mates, not experiencing even their own reflections from the water film or other surfaces, scored low in mating tests at maturity (14). In contrast, mating scores were much higher in fish given earlier experience with species mates, but scores were intermediate in subjects which, although deprived of experience with species mates, had seen their own reflections and a heterogeneous environment during early life. Even in this lower vertebrate, therefore, the ontogeny of the mating pattern seems to require both a maturation of organic mechanisms such as hormone factors and a developmental environment in which typical species experiences, including self experiences, promote an important socializing process.

To investigate the development of behavior in the domestic cat, the isolation method in a more involved form was used (9). First, the normal development of reciprocal mother-young relations as in suckling and nursing was quantified for a control group. In the experimental groups, the variable factor was experience in the litter situation, with kittens isolated for scheduled intervals, starting at birth or later, under separate maintenance in incubators serving as "artificial mothers." After their isolation periods, the respective kittens were returned to mother and litter for a detailed study of their initial and later reactions. It was found that kittens isolated from birth to two weeks or longer only very slowly establish a suckling relationship with the female and social relations with litter mates. The readjustments vary individually and never quite reach normal standards. Kittens isolated during later times in the litter period show marked asocial tendencies on return, as in sleeping apart, and there are other signs of their avoiding litter mates. Although,

in such cases, responses to other kittens improve appreciably within a few days, relations with the mother improve more slowly and never become altogether normal. It is the deprived kitten who is responsible for the strained, abnormal relations that arise, not the mother, who as a rule accepts the returned isolate readily. Even limited species experience, however, may benefit ontogeny, as is indicated by the fact that kittens, when paired in the incubator, were much more relaxed and versatile there and also in their readjustment to the litter situation on return than were isolates. The greatest deficit was shown by kittens isolated from species experiences (except for sounds and odors) from birth to sexual maturity. These animals, facing species mates for the first time, never reacted "normally," but varied in their responses from "indifference" to intense disturbance, and the males seemed incapable of mating except through experience in many successive tests.

Although species behavior patterns undeniably depend on characteristic organic factors, as a rule these influences cannot be readily identified or traced out in development. One promising line of research from this standpoint concerns species orientation, or adjustment to the conditions of space and time, as in establishing a territory and mastering a route. A problem of this type was studied in the trail-following responses of newly emerged army ants. Another, also investigated in the field, concerned the orientative adaptation of goby fish in the Caribbean area to a seashore habitat despite emergencies arising daily through tidal changes (4). When these fish get cut off in isolated pools during the ebb, they are able to escape by jumping from pool to pool or to open water below and can thus evade disturbances as from predators. Observations and tests show that the fish learns the general topography of the shore habitat at high tide by swimming over the borders of the "pool" areas and roundabout in the vicinity; then, as an outcome of this experience, it can jump accurately as emergencies arise at low tide.

Migration is a type of orientative behavior that is vital to the environmental adaptations of many animals and especially of many birds. As a first step in our study of the basis of this behavior, the properties of adult vision are under investigation comparatively in birds of species that are regularly, partially, or not at all migratory (1). By training the birds to discriminate visual stimuli by using their conditioned responses appropriately, the capacities of visual acuity are studied under both daylight and twilight conditions in the starling (in which one race is migratory) and the robin (a fairly regular migrant). This research paves the way for studies on the wider use of visual sensitivity in migratory birds.

Although new-born mammals are often described as helpless, sessile creatures, their orientative adventures actually begin soon after birth.

Developmental research with cats involved studies of how the neonate improves in its ability to adjust to the home base and to navigate at a distance from it (9). With kittens at successive ages, observations and tests were carried out both in the home cage and in a facsimile area. Improvements in control over emotional disturbance were indicated by significant decreases in the loudness and pitch of the kitten's sound-making and also in its readiness to cry in the tests of successive days. These changes, as well as locomotor signs of an improving environmental adjustment, appeared first in the home corner within a few hours after birth, within a few days had expanded to the border of the home base, in the second week extended to the adjacent corners, and in the third week reached the corner diagonally opposite the home base. In studies at corresponding times, in an experimental area with the same type of floor and the same dimensions as the home cage, comparable improvements in behavior appeared, but always much more slowly than in the living cage itself. The results indicate a process of emotional and psychological adjustment to the home area and its vicinity, dependent both on local sensory cues and presumably also on individual factors related to experience.

Tests were carried out on the changing role of sensory factors in the kitten's orientation, paralleling behavior improvement, in a program of interchanges or renewals of the usual floor or wall units, or of their replacement by units differing in some one aspect such as odor. The results show that chemical cues become dominant in the described adjustments from within an hour or two after birth. Even at that early time, the neonate has begun a general adaptation to the home corner, the locality that is first scented strongly by the mother during the period of pregnancy and once more during parturition. The kitten's navigation about the cage improves slowly, mainly on a chemical basis but also through use of tactial cues. The eyes open after about one week, and a few days

Fig. 4. Temporary exhibit of projects carried out with the African mouthbreeding fish, *Tilapia macrocephala*, illustrating techniques for investigating and collecting these fish in the field, and for maintaining and studying them in the laboratory.

Fig. 5. Temporary exhibit of a colony of *Eciton hamatum*, set up in the Museum after a field investigation in Panama. From the wire transportation cage (left), the ants make their way through plastic tubes into the glass-walled enclosure (above), in which a typical nesting cluster of workers is formed, with queen and brood in the center. Through other tubes, the ants reach the feeding chambers and return to the nest with booty.

II/1 1959

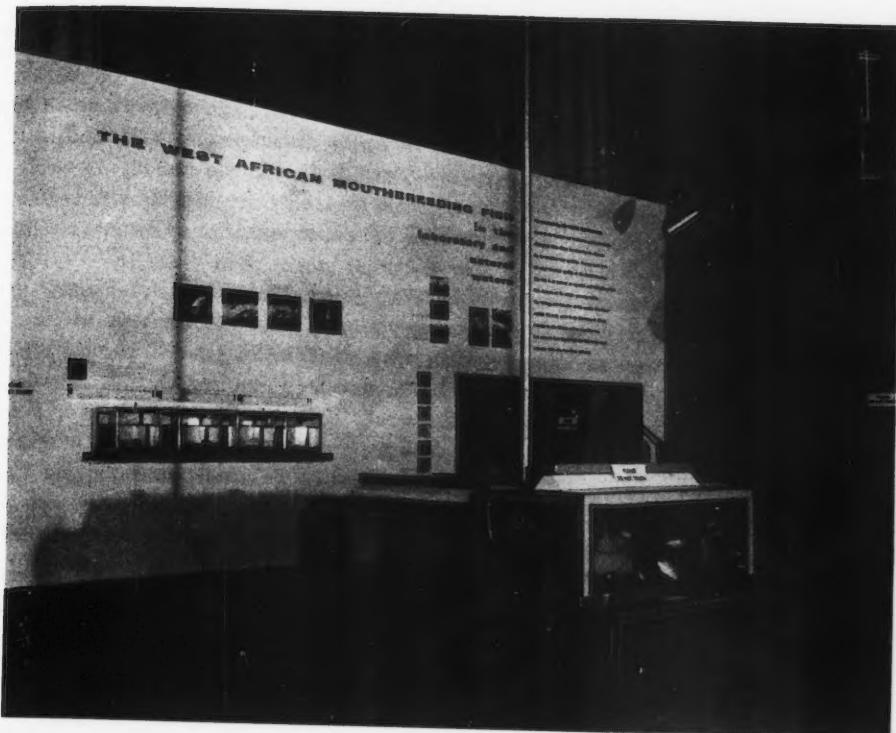


Fig. 4

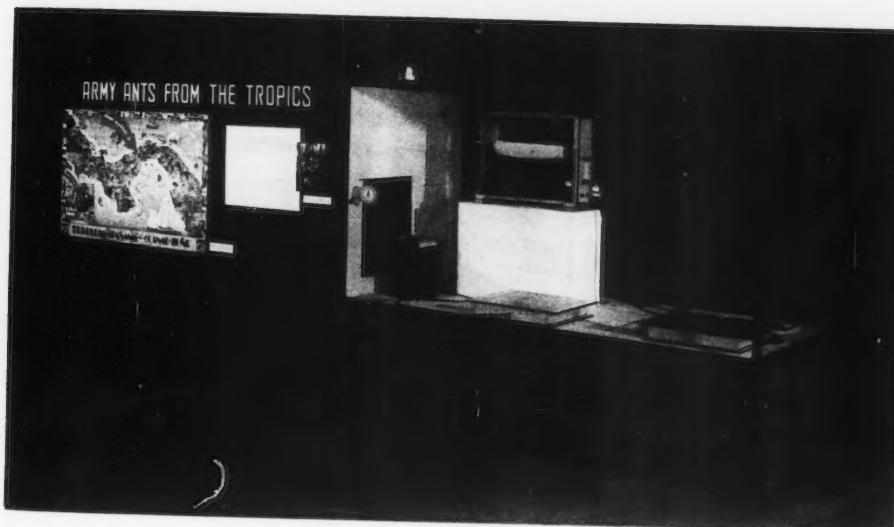


Fig. 5

CURATOR

later the kitten has begun to orient more widely afield and with a new efficiency, on a dominantly visual basis, now reaching the home corner on the diagonal across an open space rather than near the walls as before. Towards weaning time the kitten can range freely about the cage. These tests disclose the interplay of sensory, organic, and motor processes in the development of way finding in the cat. Involvement of learning in the orientative process is shown by the fact that kittens tested regularly on each day from birth are clearly superior in their orientation to kittens first tested at a later age.

These results seem relevant to species living under natural conditions. Littering females of many carnivores, in leaving their nests to forage, scatter their suckling young nearby, as these happen to disengage from the nipples. Such occurrences, as our findings suggest, may introduce for the kittens both emergencies requiring adjustment and opportunities for practice in orientation, at first near the home base and later (as attachment strengthens with age) farther afield. Independent exploratory excursions outside the nest would be facilitated thereby. As success in the independent returns would depend on factors such as strength, sensitivity, and learning capacity, these occurrences may well have an appreciable selective importance.

Museum biologists are concerned about the relative weight of similarities and differences in the adaptive characteristics of closely related and of distantly related species of animals. This question, bearing on species backgrounds in natural selection, enlists the behavior specialist, and several projects of the kind have been carried out in our program. In these comparisons, the ecological and population characteristics of the species have been studied in relation to their behavior and general biology.

A long-term investigation of two closely related species of army ants in the genus *Eciton* has shown that, although their behavior patterns have equivalent biological bases, differences in nesting, predation, and nomadic functions are sufficiently great to enable these species to live in the same forest habitat throughout the American tropics (12). One of these two species raids in large swarms and captures hard-bodied arthropods as its principal prey; the other raids in branching columns and takes mainly soft-bodied booty. Variations in the colony populations and functional cycles of the first species on Trinidad, perhaps related to a distinct release from competition there, may be due less to the absence from that island of the second species than to the absence of a species in the genus *Labidus*. On the mainland, the latter overlaps the two *Eciton* species in habitat, but, like the first of these, is a swarm-raider, hence is more competitive with it than is the second *Eciton* species.

Comparisons of closely related genera also have been undertaken in

II/1 1959

our program. In the field, the adaptive patterns of two different genera of army ants have been compared, one represented by species indigenous to the tropics, the other by a species of the North Temperate zone (13). Fundamental similarities exist between the two in their functional cycles, and in the organic processes underlying them, but with significant differences seemingly referable to secondary biological mechanisms arising through evolution of seasonal adaptations in the latter. In the mammals, comparisons of strains of domestic mice and rats have been made, particularly with respect to the tensional and "emotional" properties of their behavior. Inclusion in this comparison of members of a related genus brought in from their natural habitat is contemplated.

Our research necessarily involves a vigilance for the role of heredity in species-typical behavior. Such a consideration, in view of the traditional museum interest in the processes of evolution, is consistent with an increasing awareness in modern systematics of the merging of behavioral, ecological, and structural evidence in the study of selective processes. In the defining of a species, for example, a criterion now generally stressed is a reproductive isolation or failure to cross with related groups living in the same or adjoining natural areas. Factors underlying such reproductive insulation, the so-called "isolating mechanisms," are incompletely known. One of our projects (5) concerned what reproductive barriers might exist between two closely related species of poeciliid fishes, the platyfish and the swordtail, found living in close proximity in their native rivers in Mexico, without their crossing, or at least without their producing viable hybrids. Under appropriate conditions, however, these species were made to cross in the laboratory. Behavior analysis and appropriate tests disclosed the influence of numerous isolating mechanisms, and not, as is often suggested for such processes, just one or two. These factors varied in nature and in their combinations, including items in behavior (e.g., differences in movement), physiology (e.g., differences in sperm viability), and morphology (e.g., male gonopod structure). Studies such as this, in which specialists in genetics, ecology, and behavior join forces, exemplify a type of research that progresses well in the museum situation.

Our general emphasis is on the normal range of behavior within a population living in the species niche or typical environment. Yet in science much can be learned about the normal or usual from the abnormal, and attention has been turning therefore to studies on how organisms meet abnormal or extreme conditions. A notable example is Selye's research on physiologically taxing conditions or "stressors," such as extremes of temperature. But the role of other types of extreme conditions, including the psychological, has not been explored very system-



Fig. 6. Putting "Tiger's" sound effects on record. Illustrating one of numerous projects involved in study of the everyday behavior of animals. (Photograph courtesy of Don Rice, the New York Herald Tribune.)

atically. If we are to understand adaptive behavior well, it is necessary to go beyond the physiological to examine the effects of emotional crises and problem situations that tax species resources. One study in our laboratory measured the relationship between the mild stress of a variable environment early in life and degree of susceptibility to tuberculosis infection in several strains of rats and mice (17). It was found that animals that reacted to stressful conditions with greater locomotor and emotional disturbance were more susceptible to the disease than were those less affected by the stresses. Also, the various genetic strains ranked in the same order in their susceptibilities to the environmental stresses as in their proneness to the disease, and a high correlation was found between these two characteristics among individuals in each of the groups.

A striking result of these experiments was the extent to which individuals in the same group might differ one from another in their reactions to a common stressful test. Examining the basis of individual differences within a species population subjected to taxing conditions

is one object of an experiment with mammals now in its pilot stage in our laboratory. The principal aim of this research is to examine how controlled instabilities in different aspects of environment affecting individuals during the early stages of life may influence their capacities to meet stresses of various kinds introduced later under test conditions.

Research of this kind should help to clarify variations in the adaptive efficiency of behavior under natural conditions, particularly as concerns emergencies beyond the normal limits of species tolerance. The study of adjustments to sensory, physiological, and problem stresses under experimental conditions may cast some light on what factors influence the normal properties of a species for tolerating such conditions, and what types of maladjustments may arise in a population when the intensity of stresses presented by predators, scarcities, over-population, and other hazards exceeds its resources for readjustment. This line of research should be increasingly valuable when it is carried into the area of species comparisons.

Although scientific departments specializing in the investigation of animal behavior and psychology are still exceedingly rare among the natural history museums of the world, advances in science have prepared the way for them. In such programs, museums, which are best fitted to integrate field and laboratory methods and to utilize the comparative approach, have an important opportunity for scientific pioneering. The natural history museum, because of its time-strengthened goals, appropriate facilities, and experienced staff, offers an optimal environment for doing such work well. Let us hope that this opportunity will be accepted.

In keeping with their responsibilities in modern times, natural history museums have a real need for comprehensive programs in the comparative study of behavior. Nature faking is as much out of place in animal psychology as it is recognized to be in other fields of natural history. Yet loose analogy and anecdote still frequently govern public interpretations of animal activities and capacities, even occasionally in science. If museum scientists are not prepared to offer sound interpretations of behavior, they have small reason to complain when hearsay and uncritical inference hold sway in books, the press, and even in classrooms. Increasingly, in these times, conclusions vital to man's welfare are drawn from inferences about lower animals in areas from education to the mental clinic. To avoid harmful misconceptions in this field, as in other areas of science, evidence must meet good standards of reliability, and theory good standards of validity, before either can be taken seriously into account.

Only with the first real scientific investigations of animal behavior

after Darwin did man become impelled to study his own origin and his own nature through systematic comparisons with lower animals as well as through studying himself. He has learned that his superiority in the phyletic scale is indicated not so much by specific organic details, which (except for cerebral cortex, grasping hand, facial musculature, and a few other details) in fact often reverse it, as by his mental capacities from perception to reasoning. To be sure, man's verbal, conceptual language and broader reasoning capacity, based on advances in cerebral cortex, so vastly extend his control over space, time, and social processes as to give the impression of absolute differences from lower animals. Through experience, however, scientists who study animal psychology have become cautious about any sweeping use of the terms "absolute" and "relative" in such respects. Solutions by reasoning, for example, have been demonstrated in mammals down to the rodents; also a gestural language has been demonstrated in chimpanzees; and beyond doubt the intellectual attainments of primitive, small-brained men were limited indeed. From such considerations, scientists realize the defects of dogmatic answers, such as were prevalent in pre-experimental times, about the mental capacities of animals as compared with those of man and are wary of their modern counterparts.

Not only in research, in which the comparative study of animal psychology encounters many unanswered problems, but also in interpretation, there must be an adequate rapprochement of biology and psychology if the needs of the future are to be met adequately. Only an effective comparative study in science of the psychology of the lower animals in relation to that of man can meet the atavistic dogma that evolutionary principles do not apply to man in the psychological sense. Clearly, much remains to be done, for only during the past few decades has man seriously directed his scientific resources to the end of investigating such questions systematically.

The general responsibility of museum research on behavior is to integrate studies of specific problems and of representative animal types with the derivation of general principles concerning adaptive behavior. In recent decades, the results of psychological research on lower animals often have been applied formally to the human level, in the study of general problems such as learning, with some freedom, although not always with due regard to scientific support for the extrapolation. Science, of course, has found that man can learn much about himself through studying lower animals, also about lower animals through studying man, and psychological problems are included. The conclusions, however, do not follow at once from general similarities alone; rather, they must be worked out through procedures in method and theory adequate to the task of evaluating both the similarities and the differences. The functions

of the zoological museum to investigate nature and to teach about nature inevitably involve considerations such as these, when questions are raised about what animals do and why they do it.

A department devoted to investigating broad problems in the behavior and psychology of animals, although a new feature in the natural history museum, should become a commonplace as museums better realize their potentialities, responsibilities, and goals in keeping with the advances of science and the increasing problems of man in modern times.

BIBLIOGRAPHY

1. Adler, H. E., and J. I. Dalland: *Spectral sensitivity in the starling (Sturnus vulgaris)*. Jour. Comp. Physiol. Psychol. (In press.)
2. Aronson, L. R.: *Problems in the behavior and physiology of a species of African mouthbreeding fish*. Trans. New York Acad. Sci., ser. 2, vol. 2, pp. 33-42. 1948.
3. Aronson, L. R.: *An analysis of the reproductive behavior of the mouthbreeding cichlid fish, Tilapia macrocephala (Bleeker)*. Zoologica, vol. 34, pp. 133-158. 1949.
4. Aronson, L. R.: *Orientation and jumping behavior in the gobiid fish Bathygobius soporator*. Amer. Mus. Novitates, no. 1486, pp. 1-22. 1951.
5. Clark, E., L. R. Aronson, and M. Gordon: *Mating behavior patterns in two sympatric species of xiphophorin fishes: their inheritance and significance in sexual isolation*. Bull. Amer. Mus. Nat. Hist., vol. 103, pp. 141-225. 1954.
6. Lehrman, D. L.: *The physiological basis of parental behavior in the ring-dove*. Behaviour, vol. 7, pp. 241-286. 1955.
7. Noble, G. K., M. Wurm, and A. Schmidt: *Social behavior of the black-crowned night heron*. Auk, vol. 55, pp. 7-40. 1938.
8. Rosenblatt, J. S., and L. R. Aronson: *The decline of sexual behavior in male cats after castration with special reference to the role of prior sexual experience*. Behaviour, vol. 12, pp. 285-338. 1958.
9. Rosenblatt, J. S., G. Turkewitz, R. Cohn, and T. C. Schneirla: *Studies of early socialization and adjustment to the litter situation in the domestic cat*. (In MS.)
10. Schneirla, T. C.: *The relationship between observation and experimentation in the field study of behavior*. Ann. New York Acad. Sci., vol. 51, pp. 1022-1044. 1950.
11. Schneirla, T. C.: *Interrelationships of the "innate" and the "acquired" in instinctive behavior*. Chapter 10 of *L'instinct dans le comportement des animaux et de l'homme*. Paris, Masson et Cie, pp. 387-452. 1956.
12. Schneirla, T. C.: *A comparison of species and genera in the ant subfamily Dorylinae with respect to functional pattern*. Insectes Sociaux, vol. 4, pp. 259-298. 1957.
13. Schneirla, T. C.: *The behavior and biology of certain Nearctic army ants*. Insectes Sociaux, vol. 5, pp. 215-255. 1958.
14. Shaw, E.: *Sexual behavior of male platyfish reared in altered environments*. Anat. Rec., vol. 128, p. 621. 1957. (MS in preparation.)

CURATOR

15. Tavolga, W. N.: *Reproductive behavior in the gobiid fish Bathygobius soporator.* Bull. Amer. Mus. Nat. Hist., vol. 104, pp. 431-459. 1954.
16. Tavolga, W. N.: *Visual, chemical and sound stimuli as cues in the sex discriminatory behavior of the gobiid fish Bathygobius soporator.* Zoologica, vol. 41, pp. 49-64. 1956.
17. Tobach, E.: *A study of the relationship between behavior and susceptibility to tuberculosis in rats and mice.* Adv. Tuberc. Res., vol. 6, pp. 62-89. 1955.
18. Tobach, E., M. L. Failla, R. Cohn, and T. C. Schneirla: *Analytical studies of maternal behavior and litter relations in the domestic cat. I. Parturition.* Anat. Rec., vol. 122, pp. 423-424. 1955. (MS in preparation.)

Art Museum Publications— Their Nature and Design

RICHARD N. GREGG

CURATORIAL ASSISTANT, THE TOLEDO MUSEUM OF ART

Any curious clerk in a major United States post office could become well informed in the visual arts within a relatively short time. All he would need to do would be to read the vast quantity of daily mailings of printed matter concerned with the attempt to interest people in and inform them about paintings, drawings, prints, sculpture, ceramics, textiles, furniture, industrial design, and architecture from the world's past and present. These mailings are in the form of books, magazines, catalogues, reproductions, bulletins, invitations, calendars, postcards, letters, folders, and the like, and they are distributed mainly by publishers, art dealers, commercial galleries, and art museums. In short, these are visual communications about visual communications.

This seeming redundancy occurs primarily as a form of self-justification, because the art museum of today must compete for the attention of its public with a host of new consumers of its leisure time, such as television, motion pictures, newspapers, magazines, organized sports, and social clubs. The competition stiffens daily. We in the museum world in particular are deeply concerned that our printed messages be read and understood and reacted to by the recipients. Almost all American museums are engaged in making their collections and activities more interesting and attractive to an ever-growing audience. Regardless of whether they are publicly or privately supported, they all increasingly recognize a need to tell people what goes on within their walls. Never before has so much been printed to interest so many in the visual arts.

Mrs. Elizabeth M. Geiken, Director of the Davenport Municipal Art Gallery, states: "I feel that printed material for a museum should be

compared with a display window in a department store. It makes an impression on people by which they, in turn, critically evaluate the institution." Putting it another way, Thomas C. Colt, Jr., Director of The Dayton Art Institute, believes that all printed matter issued by his organization is important because "it is a visual representation of the values of the institution."

The present article is based on a survey by questionnaire to determine the effectiveness of the printed matter distributed by thirty-nine large and small municipal art museums in the United States. It is hoped that the following descriptions of some of the material, and the illustrations of a few examples of the printed pieces, contain certain basic or novel ideas that can be adapted to science or history museums as well. The questions on the survey sheet were deliberately generalized ones, with the intention that they would be amenable to individual interpretation and thus produce revealing answers.

One of the major questions asked was: "What does your museum aim for through the visual effect of the printed matter it puts out?" The answers varied, but the most typical was "order in both content and visual presentation." Here are some of the other answers: "information value," "neat design is always hoped for and with more elaborate publications good design is always sought," "to attract attention through a dignified presentation," "impact," "good design and all it implies," "economy," "brevity," "attention," "to project the character and concern of the organization which is devoted to informing and educating the public," "dignity and eye appeal," "to maintain the same standard of excellence which governs our choices in all of the visual arts," "to produce a lasting impression," and "lively informality with enough dignity to satisfy the sober-minded." Although these answers say virtually the same thing, it is interesting to note that the accompanying pieces did not always visually convey the same message.

In addition to having a general policy in regard to all its printed matter, a museum must consider each publication separately, whether it is a mimeographed item or an impressive exhibition catalogue in the form of a book, and ask itself what the ultimate value of the piece is to be.

William A. Bostick of The Detroit Institute of Arts suggests that there are two major categories of printed matter: one that stimulates the public to visit the museum, and one that interprets the collection for the public. By far the greatest number of items collected in the course of the survey are in the former group and consist of monthly calendars, invitations to special exhibitions and lectures, announcements, posters, stationery, membership folders, art class information for adults and children, and general data about the museum.

The collection is "interpreted" by special exhibition catalogues, a

general or specific guide or handbook to the collections, monthly or quarterly bulletins, reproductions, and labels and other informative literature on or near the objects.

Of course, not all museums print so large a quantity of material as is represented by all these categories, but each museum that was questioned tries to use these two major categories in its own way.

THE MONTHLY CALENDAR

Of all publications from large and small art museums in America, the "Calendar of Events," "Attractions," "Program of Activities," "Bulletin," "News," "Poster of Events," or whatever the monthly mailings may be called, have by far the largest circulation, for they are the most frequently issued and the most immediate contact with the members and the general public and most clearly reveal the basic character of the organization.

Some of the topics that appear are: exhibition announcements (in some cases containing extensive descriptive notes, and in others with each item listed as in a catalogue); lectures (presented either for the general public or only for members by the staff or visiting lecturers); invitations to openings of monthly exhibitions (for special exhibitions members receive separate notices); art (and sometimes music) classes for adults and children; recent accessions; demonstrations; lists of new members; films to be shown; and radio and television programs, should the museum recommend them. In some of the smaller art museums these monthly notices are in the form of chatty "news letters." In the larger organizations the various points are listed simply and directly, on the assumption that there are many demands on a reader's time and therefore a meaningful statement must be made quickly.

More than half of the samples received by the author were produced by offset lithography; the rest were printed by letterpress or mimeographed. In only five cases was a sans serif type face used throughout; all of these were printed by letterpress.

Of all the examples, only about one-third were printed in two colors. Color, when it was used, other than black, was changed each month for variety. In only four cases was color used effectively on the outside of the publication, which is strange, because color is what a reader first responds to when sorting his daily mail.

The monthly reports of more than half of the museums represented in the survey contained photographs, and, although the quality of reproduction varied, that the illustrations were in general quite effective seems to argue that the other museums should illustrate their current exhibitions or latest additions to their collections.

The sheet on which such monthly listings are printed is usually approximately seventeen inches by eleven, folded once vertically and twice

horizontally, to make a piece standard in size, printed on both sides, with one face of the folded sheet left blank for an address. These folders can be mailed in bulk at third-class postal rates.

This monthly mailing is the museum speaking for itself. In general it is directed towards people who have shown that they care about the museum by having become members, and to those whom the museum wants to enlist as friends. The net reason for its distribution is to interest thinking people in visiting the galleries again and again.

ANNUAL ANNOUNCEMENTS OF ACTIVITIES

Nearly all of the small, and a few of the large, museums print yearly announcements of activities, sometimes, for the smaller museums, as a substitute for the monthly announcements. These are generally available at the beginning of each season and list adult and children's classes, future exhibitions, lectures, concerts, and films. In this calendar, also appears some information on membership—the ever-present sales pitch! A very pleasing sample comes from the South Bend Art Center. Its attractive gray cover has a repeat of the organization's initials, and the information on the inside is printed on two different shades of paper. Each category is equally identifiable through the use of neat type.

MEMBERSHIP LITERATURE

Nearly every museum is vitally interested in its membership and its continued growth. The members of an organization help give life to a civic enterprise in which they have pride, and the funds they supply annually either support the museum entirely or substantially contribute to its budget.

Although the approach used to gain and retain members varies, depending on the size of an institution and of the sums received from this source, two basic points are usually stressed—what a member receives in special privileges and benefits, and what he gives to others in supporting the continuation of an important cultural element for the entire community. The majority of museums have some sort of membership literature that emphasizes these two approaches and tells something about the institution—its history, collections, activities, and membership classes. In many instances one printed piece is redesigned every year for the annual drive for membership or money and is produced in quantity so that it will be available to any gallery visitor at any time throughout the year. No size is typical for these main membership folders, and they differ greatly in presentation and emphasis. The Art Institute of Chicago prints a small, black and white, one-fold piece stressing "more pleasure for you and your family." The Cincinnati Contemporary Arts Center has three amusingly drawn angels in color on a folder with the legend "be

an angel . . ." The Worcester Art Museum mailed a two-color, two-fold piece with 27 reproductions of their collections. The Brooklyn Museum used "shocking pink" on one entire side of their folder. The Houston Museum of Fine Arts used a stylized, outstretched hand on their "new member round-up" leaflet. The Los Angeles County Museum, in a right-to-the-point, two-color folder, stated that "your enjoyment is even greater when you have a personal stake in the affairs of your museum." Both The Metropolitan Museum of Art and The Museum of Modern Art used many photographs of their collections and activities. The Walker Art Center designed a long, narrow, ocher, emerald, and black folder on white, textured paper to list the "9 keys to a greater family culture." The Toledo Museum of Art hands out a red, black, and white book-mark, with the hope that "you will mark your name on our membership book." And The de Young Museum of San Francisco has an embossed and engraved invitation which it sends to prospective supporters.

Although these pieces are mailed to possible members, few are direct-mail, self-enclosed items. When sent, they often are inserted in an envelope with other literature such as a letter, a statement of dues, and a return envelope for the needed check.

THE MONTHLY, QUARTERLY, OR ANNUAL BULLETIN

After having *interested* the public through its monthly calendar and intensified the interest to the point of receiving support through its membership literature, a museum undertakes the next, and more pleasant, task, which is to *interpret* the collections through the monthly, quarterly, or annual bulletins and exhibition catalogue.

For the Museum of Fine Arts in Boston the most important category of printed matter is its monthly *Bulletin*. For the Museum of Art in Philadelphia it is their *Quarterly*, because it "most adequately reflects the Museum and its affairs." Many other major museums give the same importance to a comparable publication, which is generally a scholarly periodical with the aim of educating and informing its readers and which is sent to other museums, libraries, colleges, universities, schools, and persons and organizations throughout the world that are interested in art, as well as to their own membership. Therefore, such a booklet tells much more about the caliber of the museum than the monthly calendar and is considered a prestige publication.

Certainly not every museum can be or cares to be responsible for such an impressive item. The lack of time, staff, collections, funds, or real necessity may make its preparation and publication impossible. In fact only fifteen publications of this nature were received in response to the thirty-nine inquiries that were sent.

The articles in these bulletins have to do chiefly with the museums'

collections, and in general report on recent accessions in various fields of art. In some cases an entire issue is devoted to a specific topic, such as the arts of the Middle Ages (Museum of Fine Arts, Boston), a twenty-fifth anniversary (The Museum of Modern Art, New York), Holland in the seventeenth century (The Toledo Museum of Art), or a Max Beckmann triptych (The Minneapolis Institute of Arts).

Some of these publications serve purposes other than scholarly. Once a year, many list the names of all their members; a few combine such a list with the annual report. Some chronicle their various art classes, concerts, films, special exhibitions, children's museum, staff activities, and the like, as in the monthly or annual calendars.

In contrast to other museum publications, this type of bulletin is of a size that is nearly uniform, about seven and one-half by ten inches. Rarely does it consist of fewer than eight pages. Although it may be well illustrated, in no example did color appear on the inner pages, and in only a few is color used for the illustration on the cover, which can be accounted for by the excessively high cost of full-color printing. Most of the covers, however, are of colored stock printed in one or more inks, with black.

CATALOGUES

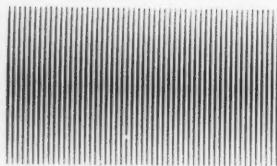
Most art museums, large and small, hold at least one, but usually many, temporary exhibitions in their galleries during the year, supplementing the permanent collections. Occasionally such temporary exhibits are self-contained, but usually they are cooperative enterprises and include borrowings from sister institutions. For such an exhibit, a catalogue is essential. Why? Other than the obvious answer of "As a guide," various museums have recorded, that "they [catalogues] are the only means for the visitor to an exhibition to retain some image of the show years afterwards." The Wadsworth Atheneum believes that "the information contained has a long-range value." The John Herron Art Museum contends that "The Young Rembrandt and His Times . . . was not only successful in describing and illustrating the show, but is a contribution to the general literature of that period." The Milwaukee Art Center writes that "catalogues of temporary exhibitions [are considered to be the most important single category of printed matter] because [they] are part of our responsibility to lenders."

All the catalogues received by the author were most impressive, not only visually, but because the facts were presented in an interesting and informative way. There is no other single type of art museum publication on which so much time, effort, and money are spent, and the results reflect such attention.

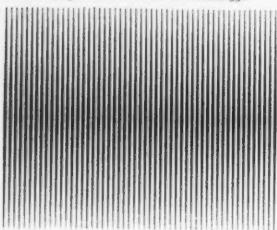
To be worth its value in the future as well as for the current exhibition,

continued on page 62

■ MEMBERSHIP LITERATURE

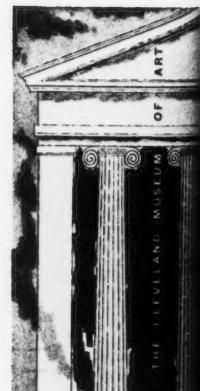
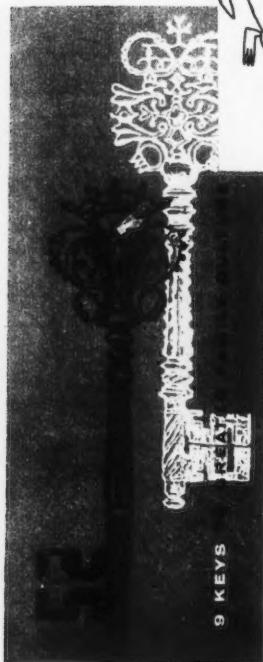


Fall Program at the Cincinnati Art Museum, 1956



1957
1958

ART CENTER



V
2
1

5
9
XU

Museum Art News Monograph (1956)



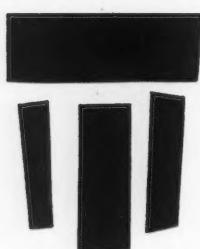
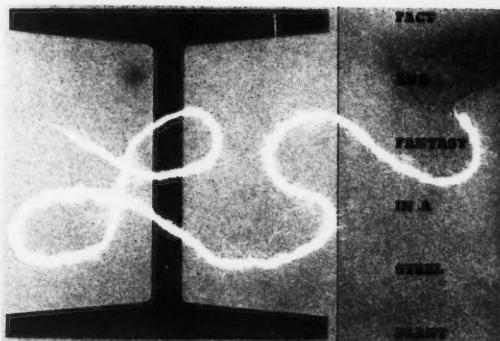
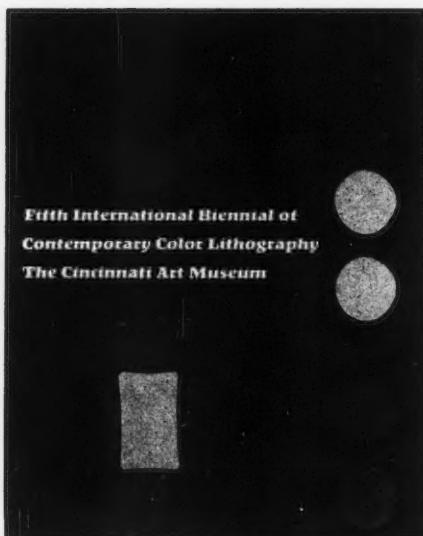
BULLETIN

Volume 200 Number 200, June 1957

Museum of Fine Arts, Boston



CATALOGUES



AMERICAN PAINTINGS

1946-1957

PICASSO
75th ANNIVERSARY EXHIBITION

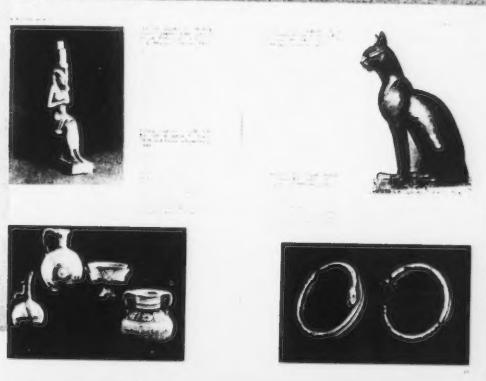
GUIDES TO COLLECTIONS



GLASS
from
The Corning Museum
of Glass

A GUIDE TO THE
COLLECTIONS

**Wadsworth
Atheneum**

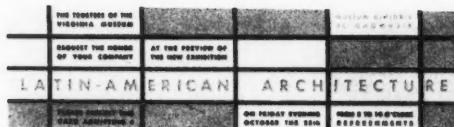


59
XUM

■ INVITATIONS



european
masters
of our time



PRESENTED BY THE CORNING MUSEUM OF GLASS
CORNING GLASS CENTER CORNING, NEW YORK
DECEMBER 4, 1957 THROUGH JANUARY 5, 1958



The Board of Trustees
and
The Activities Council
of
The Portland Art Association
cordially invite you
to the preview of
The 1958 Exhibition
of
The Northwest Institute
of Sculptors
at
The Portland Art Museum
May second, 1958
from 8:30 until 10 o'clock

THE TOLEDO MUSEUM OF ART
FOUNDED BY EDWARD DRUMMOND LIBBEY

A
GUIDE
TO
THE
CORNING
GLASS
CENTER

**BROOKLYN
MUSEUM**

ENTRANCE STAIRWAY

MUSEUM HIGHLIGHTS

1st Floor: Painting and sculpture by noted artists from many parts of the world. The collection is especially powerful in that field. The galleries happen to be among the best in the country for teaching and research. The Sculpture Gallery is a unique source of uncarved tree-roots, pottery from 27 countries, and bronze casts of classical statuettes.

2nd Floor: The Art School: painting, sculpture and criticism, work taught in adults, seniors and professionals, day and night. The School has a large studio, old and modern studios, a wood shop, a print room and library. The School has a large collection of fine specimens. It has a huge collection of American and European costume. The Oriental Room contains a collection of Chinese, Japanese art and Chinese pens. The Art Reference Library also contains precious books and unusual documents.

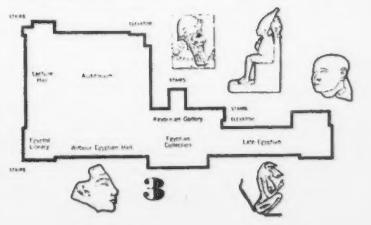
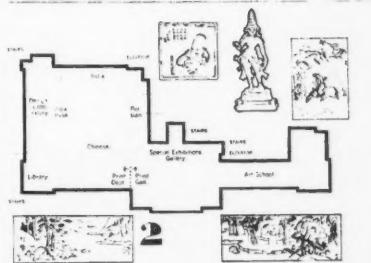
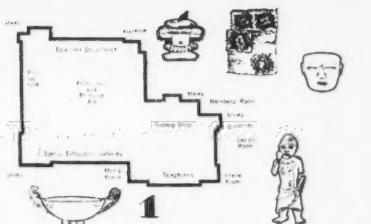
3rd Floor: A Auditorium and Egyptian Collection is one of the three or four finest in the world and contains many items of great interest. The Egyptian collection is the best in the U.S. Free concerts are offered every Sunday in the Egyptian Auditorium and the New York City Concert Series. These are followed by free lectures by art experts in the evenings. I visited Times on certain Sundays afternoons previous week and enjoyed greatly.

4th Floor: Here are white houses of various sizes, some with delicate lacework, tapestry with furnishings and decorative arts from many countries.

5th Floor: Here the newly built Sculpture Court contains a collection of the Museum's fine display cases for its sculpture collection—of particular interest in modern American sculpture. This floor also contains a large collection of American historical paintings and American drawings.

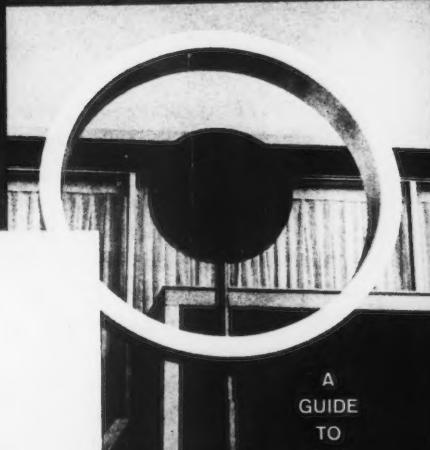
6th Floor: A large gallery houses first American and European watercolors.

If you wish to see any of the major activities of the Museum, you are invited to become a Member (for \$12 annually). The official membership card entitles you to discounts, opportunities and frequent films, invitations to preview and other benefits. The Museum's unique collection of Mexican events, free range of certain exhibits, free quarterly "Brooklyn Art" set up especially arranged for Members,等等.



How
to get
to
the

**BROOKLYN
MUSEUM**



a catalogue lists as a minimum: the title of each object, its size, its date of execution, the name of the artist, the medium, and the lender. If known the following facts are also given: the nationality of the artist, whether or not the object is signed, in what collections it has appeared, and what references to it have appeared in print. A biography of the artist and any other pertinent notes are helpful and add further interest. Moreover, because the object is perceived visually, it is desirable that it be illustrated, preferably in color. Collateral notes on the history of the time in which the objects were created help to place the exhibition in fuller perspective and to make the catalogue more enjoyable for the reader.

The size of each catalogue and the amount of information it contains vary, of course, and depend on the importance of the exhibition, the funds available, and the sponsoring organization.

Such catalogues are sold at the exhibition itself and range in price from fifty cents to two dollars and fifty cents. In many instances they are sent free to members as one of the benefits of membership, and are also sent on exchange to other museums, libraries, and art galleries.

Following are descriptions of a few examples, which were selected from the many excellent catalogues of special exhibits that were sent to the author:

"Glass from the Ancient World" is the title of a catalogue of an exhibition from the collection of Ray Winfield Smith shown at The Corning Museum of Glass. It covers 611 objects, the majority of which are illustrated by magnificent photographs. The extensive research and the clarity of the writing make this work an important reference.

"Masterpieces of Korean Art": The handsome catalogue of this exhibition was designed by Carl F. Zahn of the Boston Museum of Fine Arts. The many objects are well illustrated (about half with a black background to point up especially the translucent quality of the ceramics), and each one is concisely described. As an aid to the uninitiated reader, on the reverse of the front cover are a detailed map of Korea and a list of the leading Korean and Chinese dynasties.

"Fifth International Biennial of Contemporary Color Lithography" at The Cincinnati Art Museum: The entire nature of this catalogue—its size, its strength, the contrast of paper and type, and its highly authentic reproductions, which reveal the fine quality of some contemporary color lithography—is excellent. As are the majority of handsomely printed items of The Cincinnati Art Museum, this catalogue was designed by Noel Martin.

The Contemporary Arts Museum of Houston prints a catalogue for each of its special exhibitions throughout the year. Each is of the same size and uses the same kind of type. Unexpected variety is achieved with bright green end papers in one sample, embossed shapes for texture on

another cover, and a silk shantung cover for the exhibition "The Common Denominator, Modern Design, 3500 B.C.-1958 A.D."

GUIDES, OR HANDBOOKS, TO COLLECTIONS

All art museums interested in interpreting and describing their collections—and what ones can afford not to be?—also have some sort of publication that lists, and in some cases describes, their permanent holdings. Some of these are merely informal notes about the major features of each gallery or hall, while others are extensive listings of each item, presented as in the catalogues to temporary exhibits.

These guides, or handbooks, to the permanent collections are important not only for the casual art lover, from which he may learn more as he visits the galleries, but also as a record for the information of other museums, as well as the public, of what each institution owns. New art objects are constantly being added to collections, which make these listings just as constantly out of date. New purchases are announced in either the monthly calendars or bulletins, but many organizations revise their accessions only once a year.

The Cincinnati Art Museum and The Corning Museum of Glass are responsible for truly impressive guides. The standard of photography in each is very high. The Museum of Fine Arts in Boston has issued a handsome guide to its collection of ship models. The superb photographs, which show many details not generally noticed, and the layout of the entire booklet, together with its well-designed blue and white cover, place it on a high peak of art museum publication.

The Detroit Institute of Arts has a very useful guide which includes not only a tour through the various galleries and a floor plan but also a page stating how to enjoy the museum so that a visit will be more pleasant and profitable.

The Cleveland Museum of Art, with the opening of its new extension, brought out a handsome and clear-cut handbook. On each page is a strip of photographs of some of the Museum's most important objects, briefly described elsewhere on the page. The Wadsworth Atheneum has also recently published a handbook, with pictures of the objects and a description on each page, but in not so standardized a form.

An interesting point is that all these guides are very readable, so that they can be enjoyed for themselves even if a reader never sees the actual objects, although their primary purpose is that they be used in the galleries.

INVITATIONS TO SPECIAL EVENTS

One of the privileges of being a member of an art museum is receiving special invitations to exhibition previews or other semi-private, out-

standing events. In the past, these invitations have been (and the majority still are) very formalized and conventional in appearance, and dull, which rarely is the nature or real intent of the occasion. Nowadays, art museums are increasingly aware that not all members respond to invitations to "openings" or wish to attend these crowded social affairs, so that the growing tendency is to design invitations in such a way that they not only suggest a festive social event, but tell something of the nature of the exhibition.

The Virginia Museum mailed an invitation that was silk-screened on a thin sheet of acetate. The exhibition was of Latin American architecture, and the design was in the form of a contemporary building exterior. The Virginia Museum was also responsible for sending an invitation in the shape of a large theater ticket, for the opening night of "Theater Designs" by Donald Oenslager. It is printed in black on magenta "Day-glo" and creates a very dramatic effect. For the opening of the Primitive Arts Gallery, The Baltimore Museum of Art posted an invitation in orange, yellow, and black, on which were pictured three striking tribal masks. The City Art Museum of St. Louis was responsible for an invitation to an exhibition of Japanese art of the Edo Period which consisted of a vermilion cover on which were printed three Japanese characters in gray. Members of The Columbus Gallery of Fine Arts received an invitation to the Joshua Reynolds Exhibition done in the manner of an eighteenth-century announcement, with the use of the antique letter "s." It "attracted an unusual number of patrons," and the Gallery considered it to be one of the most successful single items printed during the year. The Dayton Art Institute, in keeping with its newly established policy of having all printing standardized in appearance, mails invitations that have the same basic layout, regardless of the differences in exhibitions. Variety is achieved in the choice of rich colors and in the use of fine typography. The Solomon R. Guggenheim Museum also follows such a scheme, but color is not used. That Museum relies on two type faces printed in black on a white, high-quality, textured stock, which reflect a most restrained attitude in contrast to its generally unrestrained displays!

FLOOR PLANS

Directing people is an important function in a large museum, for few buildings are laid out in a clear pattern. Because these floor plans are handed out free at the museum entrance, many museums include membership information, together with a simple explanatory text about the exhibitions. Some floor plans are accompanied by small, simplified maps of the surrounding city and are mailed to out-of-town friends for their convenience in locating the museum.

POSTERS

A few museums feel that a special exhibition can be promoted best by the mailing out of colorful posters. Some of these are eight by ten inches in size, a sheet that can easily be tacked to any bulletin board. Some are placed on the bumpers of taxis, some in public transport vehicles, and larger ones on billboards; The Art Institute of Chicago, for instance, has a printed outdoor sign that measures about four by seven feet.

Many times posters are visually coördinated with other promotional devices so that the public will come to recognize them and sooner or later decide to see "what they are all about."

STATIONERY

Needless to say, every museum sends letters, statements, invoices, and the like. One would suppose that the type of institution a museum is and its distinguishing characteristics would be reflected in its letterhead, but it is surprising how many museums employ similar type faces on their stationery. On the other hand, many museums, in an attempt to identify themselves more precisely, use a seal or cipher. The Dayton Art Institute has a new design in which the initials are derived from the beautiful signature of Albrecht Dürer.

REPRODUCTIONS

Each museum financially able to do so makes reproductions of some of its most important holdings available to the public for a small charge. These reproductions are primarily in the form of picture postcards, although sometimes large copies are made. This service affords an excellent way of enabling visitors to carry a memory of their favorite works home and is an important educational device. For these reasons many museums place great emphasis on this category. In quality the reproductions range from harsh-colored ones that have none of the true tonal values of the original to the National Gallery's superb print of Manet's "Gare St. Lazare." There is a growing tendency among museums to have at their sales desks copies of the best reproductions of paintings in other museums as well as of those in their own, so that it may soon be possible to have in the home, at a very moderate cost, copies of some of our country's great visual treasures.

MAGAZINES

One of the most scholarly and respected art magazines in America, *The Art Quarterly*, is sponsored by an art museum, The Detroit Institute of Arts. Originated in 1938 by the late Dr. William R. Valentiner, then Director, and the present Director, Dr. Edgar P. Richardson, it is today

of great aid to the art historian, curator, and others seriously interested in the subject. Although a few articles are written periodically by Institute staff members (it is not by any means considered a spokesman for that organization alone), many are contributed by others who are outstanding in the field of art. Less scholarly, but extremely popular, is *The Walker Art Center's Design Quarterly*, a report on the contemporary arts which covers also the field of handcrafts and industrial design. As well as being a voice for the designer and craftsman, it is also a guide for the consumer of well-designed, low-cost products. It was once called, very aptly, *Everyday Art Quarterly*, but conceivably this title may have been limiting. Not an intrinsic part of any one art museum, *The Journal of Aesthetics and Art Criticism* is one of the most stimulating quarterlies of its kind. It is published for The American Society for Aesthetics in cooperation with Western Reserve University and The Cleveland Museum of Art, and edited by Dr. Thomas Munro, Curator of Education at the latter institution.

PRESSES

Because many of the major art museums produce so great a quantity of printed material, one would suppose that it would be wise for them to maintain their own printing presses. Once they did, but presently such is not the case. Only six of the thirty-nine institutions with which the author was in contact (the Carnegie, Cleveland, Brooklyn, Cincinnati, Los Angeles County, and Toledo museums) have printing equipment. Even these presses are not used for large editions, but are customarily employed for printing labels or simple one-color announcements in limited quantity. Cost and time factors are responsible for this lack of museum-owned printing presses.

CONCLUSION

In the majority of museums to which the questionnaire was sent, a professional "layout man" designs nearly every important item of printed matter. He may be a full-time or part-time staff member, a free-lance designer, or a layout artist attached to a printing company. Art museum publications are nearly always limited by insufficient funds, which often means insufficient funds to pay for the services of a good graphic designer. When the design of a publication is poor, it is invariably because the institution producing it could not or would not pay for competent design. Sometimes a museum is fortunate enough to secure the services of a brilliant designer who is willing to work for little compensation because of love of the institution itself. Such an arrangement may result, however, in the artist's insistence on having a free hand and will often produce an over-all layout program of an intensely personal design,

acting, as it were, as an advertisement for the designer, not for the institution.

Occasionally an institution of outstanding importance is compelled to use state or federal printing facilities, with unfortunate results. A case in point is the brief guide to the National Gallery of Art, which is printed by the United States Government Printing Office with as much feeling for dignity or elegance as is given to the printing of income tax forms.

That an art museum, of all institutions, is obliged to present itself visually with best foot forward to the public cannot be doubted. It cannot afford not to do so. As time goes on and it is realized that the American art museum is a kind of business, more attention will be paid to making museum printings more meaningful to a larger audience. The hoped-for result should be a greater enlightenment for more people, as well as more recognition and financial support for the institution.

V
2
5
1

5
9
XU

CURATOR

Evaluation of Extension Work with Children

JOHN R. SAUNDERS

CHAIRMAN, DEPARTMENT OF PUBLIC INSTRUCTION
THE AMERICAN MUSEUM OF NATURAL HISTORY

In frontier days, there was a popular saying that went: "We'll fight our own battles and we'll skin our own skunks." Evaluation of any educational effort is not easy. In the strong terms of our hardy pioneers, evaluation of extension work with children is *our skunk*, and no one else is going to skin it for us. But, once the job is done, and done properly, the reward will prove worthy of the effort.

By extension work, I mean the circulation of loan materials such as motion pictures, lantern slides, film strips, flat pictures, specimens, models, recordings, and games. There are other kinds of extension work, to be sure, such as radio and television, field trips, and publications, but the present paper is limited to the areas first indicated.

By extension work for children, I mean only the extension services that are directly available to individual children. School service is another area, but I feel that, as the children's museum is child-centered in its intra-museum work, so it should be in extension work. Thus, what I have to say may apply to extension work in school museums, school service, or education departments, but it is specifically directed to those engaged in bona fide children's museum work.

May I tell you what I think a children's museum is, or should be? It is a museum sponsored by either adults or by adults and children, staffed by either adults or by adults and children, and entirely devoted to meeting the needs of children in a non-school, informal, and museum-unique manner.

Therefore, the kinds of extension work that I feel most necessary for

II/1 1959

us to evaluate are those in which a child directly participates, in which the items are lent directly to the children, and in the selection and use of which the child is the primary agent.

Before we can determine the value of extension efforts, there are some things we ought to know first. We ought to be keenly aware of the expressed, documented, or implied purpose of the institution for which we labor. This purpose may be general to the point of being vague or it may be highly specific. It may allow us "to be all things to all people," or it may, by limitation, allow us to be certain things to certain people. If the purpose is general, we will have to look to the policy makers of our particular institution for clarification, lest we leap upon our museum horses and madly ride off in all directions at once. When we have a fairly clear picture of our purpose, we ought next to consider the people, or the community, for which our efforts are to be extended. All museums have an obligation to the community, which by sanction, charter, or funds, supports them. If a museum's justification for existence lies mainly in its role in the community, I do not think it unreasonable to expect the museum to know its community.

If a museum is a children's museum, it must know the community of children which it purports to serve. This means active investigation into the nature of the community. It means constant investigation, because communities change. It means knowing the child as an individual and knowing the child in his group relationship. It means understanding the community environment of which the child is a product. It means knowing other agencies at work in the community, and it means actively seeking all the aid and information those agencies can give relative to the child.

If we know our purpose, and know our community, we take the next step, which is to become aware of some of the urgent needs of the community. Then, by considering our purposes and our resources in the light of community needs, we ought to be able to plan a program that will best use our strength to help satisfy some of the community needs. Then our plans metamorphose into a program and we go to work. And this is as far as most of us go! So far, so good, but not good enough. How do we know our programs are meeting the needs of the community? Can we justly say that our statistical reports indicating volume of attendance, or volume of loans, or borrowers, indicate the degree to which our efforts have been successful? There is no automatic correlation between success and numbers in this instance. We may be meeting needs in most instances mentioned in our statistical reports, or we may not be meeting those needs.

Many of us may think we know how effective our efforts are. We may agree with Ruth Weston when she writes, "It is evident that the edu-

tional work done by the American children's museums cannot be measured merely in terms of knowledge. It gives the children 'open sesames' to wide realms of interest and in some degree the curiosity and ability to use them; and beyond this the child owes to the museum much of the moral, intellectual, and aesthetic significance of his everyday life.¹

If we mean so much to children, I believe we ought to try to find out why. We ought to find out what it is that we do with children which changes the child, or if what we do does change the child, or if that change is a significant one. Part of the question then, I think, is how can we most objectively determine the degree to which our efforts are meeting the needs of the community. Partly it is the question of determining, as objectively as possible, which of our efforts help most and which help least in meeting these community needs. It is not a simple problem; it is prone to a high degree of subjectivity. But simply because it is difficult, simply because it is apt to be quite subjective, simply because many intangibles appear to be involved are not excuses for running away from the problem.

So far I have purposely omitted the consideration of the physical museum. I know that many museums start with collections and then try to use those collections to fit the needs of the community. Historically that was the general rule. Today, I believe the idea more important than the object. I believe that it is the need of the community that must determine, to a considerable degree, the content of our physical resources in the museum. The material we circulate must be sound, significant, and timely. It should be accurate, well balanced, and fair. It should be adapted to the needs of those who use it, and it should be well organized, clear, and interesting. It must be material that is within the scope of our museum's range of interest and, preferably, material that our staff can best interpret.

Tests have been conducted to determine the effectiveness of certain visual aids in schoolroom situations. They have on the whole indicated that the use of visual aids under the direction of the teacher, and with adequate discussion and guidance, has resulted in decided educational gains. But in these instances, the children participated indirectly, and there was always a middleman in the form of a teacher. Knowing that some children were participating directly in extension work, but not knowing the extent to which they participated, I questioned the persons in our extension services regarding this matter. They said, "Oh, yes, some children come in alone, make their own selections, and make all the arrangements necessary to borrow the material." I then asked for an approximation of the number of children who did this. I was told that

¹ "American Museums and the Child," Ruth Weston, *Museums Journal*, supplement, London, 1937.

no records were kept which would show this. Then I asked if the children were asked why they wanted the material, how they intended using it, whether it met their needs, and, if not, why not. The answer was that such questions were not asked as a general rule. I then prepared a check list which I submitted to some fifty teachers who were enrolled in a course I was giving on "Museum Materials in Elementary Education." First I listed twenty-four kinds of extension services, including audio-visual aids such as motion pictures, slides, maps, charts, models, specimens, and recordings, and other services such as lecturers, field trips, and demonstrations. Then I listed five kinds of sources for these extension services: the pupils, the teachers, the school or school system, museums, and finally governmental and commercial agencies. Then I asked the teachers, who incidentally represented about forty different schools in the New York area, to check first any of the listed services or aids that they had used during this term. Then I asked them to indicate the source or sources of the aids or services that they had used. An analysis of the tabulation showed that schools and school systems were the source in thirty per cent of the cases; pupils, in twenty-seven per cent; governmental and commercial agencies, in twenty per cent; museums, in twenty per cent; and teachers, in only three per cent of the cases. The significant fact to me was that pupils were providing so much of the material and that pupils were the only one of the five sources that provided material in all types of aids. I asked the teachers if the children furnished these materials without being asked to do so by their teachers, or if the teachers canvassed the class members for materials. The answer was that in most cases the children saw the need themselves and brought in the materials without being asked.

How does one go about measuring the effectiveness of an extension program in which the museum and the child are the only participants? It might be comparable with trying to evaluate the effectiveness of the efforts of a children's section of a library.

If our goal is to increase the child's understanding of the world in which he lives, we might first decide what factors constitute a well-rounded understanding of one's environment and then set up a testing program somewhat as follows. Devise an instrument to reveal to some degree the understanding which that individual child possesses of his world. Administer the instrument or test. Then note carefully the various ways in which that child utilizes the museum's services and then, after a given period of time, readminister the instrument to determine any change. Of course, a control would be used in the form of children in the same mental age group, let us say, who are not recipients of museum service, but who are exposed to all the other impacts to which the museum-serviced children are exposed. The control group and the ex-

perimental group must be similar in as many respects as possible for the outcome to have any significance.

We might concern ourselves with attitudes. If we are interested in helping the child to have an appreciation of others who inhabit the world with him to the end that his understanding of the problems of other people enables him to remove some of the prejudices that hinder decent relationships among people, then we might be able to determine the effectiveness of our extension program in the area of desirable attitudes. There are instruments now available that can be used to indicate attitudes and change of attitudes. We cannot expect to study every child, but we can be expected to find out all we can about the impact of our efforts on children. It is more than just surveying our clients to find out how many like our efforts. We must enlist the aid of child psychologists, clinical and social psychologists, or any persons who are skilled in the observation and measurement of human behavior. We must use the tools and measuring instruments that are best fitted to give us the answers for which we are looking.

A study by Thomas J. Sinclair on "Business-Sponsored Teaching Aids"² reveals a great deal of pertinent information regarding both the preparation of extension materials and the utilization of these materials by schools. This could well have been a study of museum-sponsored teaching aids. It attempts to answer, as objectively as possible, questions such as: What are the nature, purpose, and content of sponsored aids? How are these aids prepared and produced? What are the characteristics of a good teaching aid? How can we grade, test, and estimate demand? How can we critically examine these aids? What are the value and effectiveness of these aids? How can we improve programs of sponsored aids? The data were collected via carefully prepared and pre-tested questionnaires to some one hundred business houses and some six hundred administrators and teachers. A careful examination showed, however, that actually none of the data came directly from children, the ultimate recipients of the services. For example, when an attempt was made to discover which types of aids were most popular with children, the teachers were asked to indicate their opinion on this matter based on their memory of experiences with children. According to the teachers and administrators who filled out the questionnaire, the five kinds of extension aids that have most appeal to children are, in order of appeal, motion pictures,³ comic books, tours, games, and models. So far as appeal to educators is con-

² Dansville, New York, F. A. Owen Publishing Company, 1949.

³ This study was made prior to the introduction of television sets into classrooms, and it is likely that today, in schools so equipped, television programs used in the daily teaching program might to some degree affect the ranking of motion pictures as an extension aid.

cerned, the five most appealing aids are teacher's manuals, booklets, maps, charts, and motion pictures. Games, tours, models, and comic books are down at the bottom of the list for educators, but on the top for children. This is, I think, pertinent and valuable information for those of us concerned with extension work. If we could discover similar information when we attempt to evaluate our extension work and then reorganize our services on the basis of such findings, might we not be coming closer to filling the needs of children? We have been quite opportunistic in the development of most of our extension work. It would appear that the time is at hand for us to become more objective and scientific. We ought to consider what it is we want to find out about the reaction of children to our services. We cannot assume that the things we do are good for children merely because we think they are good. Just as Anna Billings Gallup urged that "we follow the child around" in the museum, so we should follow the child around outside of the museum. We should find out how he uses the material we make available to him. We should find out what effect the use of that material has upon him. We should find out to what degree we are providing the kind of material he wants. We should find out what the child expects of us. It is our obligation to see that those things we do are meaningful for the child, that they are extensions of our set purposes, that they are logically and practically things we can and ought to do. We ought to measure the effects of our labor and constantly revise, experiment, discard and replace, and renovate and innovate services as a result of this constant alertness to the behavior and needs of our clients.

Personally, I feel that no true children's museum should service schools, or adult-led groups of children, but should work directly with the child. Extension services must be advertised to the child, they must be used selectively by the child, they must be open to critical analysis by the child, and we, the adults in children's museums, must intelligently play our role of watchful guide, willing friend and provider, diligent assurer of authenticity and accuracy, and, in a true sense, both student of and servant to that part of the community we call our children.

Can the Health Museum Flourish in America?

WINFIELD G. DOYLE

CURATOR OF EDUCATION, CLEVELAND HEALTH MUSEUM

The future of health museums appears to be good. We shall probably see more of them springing up in one form or another during the next decade. When I say in one form or another, it is perhaps well to establish early what is meant by a health museum. I use it here as a generic term, but it will soon be apparent that there are two subgenera: the health museum that is an independent organization, and the one that is a department in an established museum.

The health museum is young and untried in this country. It has many trails to blaze and some failures to face. What its development will be is not yet entirely clear, but it is safe to predict that its growth will not be stereotyped and may be along quite highly divergent lines.

In what follows, an attempt is made to present an honest appraisal of the current status of health museums and to suggest one direction, but not the only one, in which they will have to move if they are to broaden their role in the communities they serve.

LIKENESSES AND DIFFERENCES

A health museum is not a local health department, a world's fair exposition, or a clinic. It cannot and should not perform any of these functions. It "does its job the way any museum does—through exhibits and interpretation of materials—with a limited but self-selecting audience . . . motivated by a strong interest in physical and mental well-being."¹

If a museum is thought of as a social institution that collects, studies,

¹ Gebhard, Bruno, and Winfield G. Doyle, "Health Museum at Work," *Journal of School Health of the American Health Association*, March, 1958.

exhibits, and interprets materials of permanent interest, then two of these elements are missing in the health museum—collecting and research. With a few exceptions, collecting in the museum sense is neither possible nor necessary. All exhibits are designed as ideas for them are conceived. Data and information come from basic research in other fields, such as biology and medicine. Consequently a health museum, although similar to its sister museums in exhibition and education, is not in the tradition of patronage on which art museums have depended for their collections, or of academic research which has been carried on in many science museums. Instead, it is essentially an instrument for the self-education of the public.

MEETING A HUMAN NEED

The health museum's mission is to reduce illiteracy in human biology and to familiarize its visitors with authoritative, up-to-date practices in preventing ill health. The wide variety of health lessons covered is illustrated by the subjects available to a school class, such as the effects of alcohol, community health, disease and immunity, family life, dental health, genetics, human growth, mental health, and nutrition.² No other museum is equipped to perform this function in the same manner as a

² "Field Trips with a Difference," Cleveland Health Museum, 20 pp., 22 illustrations, March, 1958.

Fig. 1. The wonder of new life. The Cleveland Health Museum is the home of the Dickinson models on human development and birth.



health museum and therefore cannot offer a service that is of such immediacy to the individual and the community. Of special interest is sex and human reproduction—an area in which a major part of the work at the Cleveland Health Museum is done. Thousands of teachers, scout leaders, and parents have discovered that a visit to our "Wonder of New Life" exhibit, with its fine Dickinson models on development and child birth, provides an experience for young people that mixes a minimum of emotional trauma with a unique setting conducive to maximum learning and retention of facts. So high does interest in these exhibits run, in fact, that one often finds a youngster explaining them to his parents on a Sunday afternoon following a class visit.

The health museum also complements the work of other science museums. The biological principles learned in terms of the human body lead inevitably to a deeper appreciation of the rest of the living world, including other aspects of the science of man such as human ecology and ethnology. Familiarity with the scientific method, gained through medical and closely allied research fields, furnishes a knowledge of other branches of science and the translation of their findings into the technology of modern living.

WHAT'S IN A NAME?

Is "health museum" the most apt name for an institution that serves the functions we have just examined? The question has often been raised, and the answer is an individual matter depending on one's definition of health. To some people, health means the twelve rules for avoiding constipation. If they were subjected as children, as many still are, unfortunately, to the old methods of hygiene instruction in school, health is not very savory and has come to be a color word in their lives—preachy, distasteful, unprovocative. On the surface, a health museum would hold very little appeal. If, on the other hand, one has overcome early dislikes of the subject in the intervening years, and can now look upon health as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity,"³ then a health museum could be a place of great interest. Under this World Health Organization concept, a health museum can deal with the whole spectrum of human existence, biologically centered, with health itself as only one narrow band in that spectrum.

Whether one likes the name or not, a substitute for it is difficult to find. As a colleague recently remarked, when one is in the business of museum education, one is known more by what one does than by some fancy name one goes by. If the general public becomes acquainted with a museum through the excellence of its exhibits and the liveliness of its

³ From the preamble to the Constitution of the World Health Organization.

program, whatever name it bears does not greatly matter.

AREN'T ALL HEALTH MUSEUMS ALIKE?

The answer to this question, unfortunately, is that they are all alike. A West Coast museum director commented during a recent visit that he wanted to see what we were doing with our transparent woman, Dickinson models, and giant plastic tooth. He had seen these items in other health museums and wanted to compare notes, because part of the proposed addition to his building would be devoted to health subjects. Such uniformity is dangerous, but the reasons for it are not hard to find. The few people who have organized and operate health museums have shown little inclination to inaugurate anything new and untried; they have been timid and unimaginative, both in the scope of their subject matter and in exhibit innovations. In part their attitude is due to the common origin of all health museums. They are children of the mother institution, the Cleveland Health Museum, which in turn is a grandchild of its European counterparts. The kind of inbreeding, duplication, and imitation that forms part of the history of the health museum movement in America, flattering as it is to the pioneer group in Cleveland, has led to a kind of stagnation. The biggest contribution that can be made by those who are dedicated to the idea is to call attention to the weaknesses, and in so doing hope to post a few warning signals. It is in that spirit that I offer what follows.

A SHIFT IN EMPHASIS

Medicine has been the basis of the health-museum program in the past twenty years. I suppose that this is natural, because health is the opposite of sickness, and when a person is sick he calls his physician. However, certain elements of the medical profession have opposed health museums in principle, their argument being that there is danger in imparting medical information to a non-professional audience. The work of the national organizations such as the National Tuberculosis Association, the Heart Society, and the Mental Health Associations, plus the lead taken by many of the insurance companies in health education have proved the error of such a belief. There is now a growing group of medical men who see the health museum as a valuable instrument in preventive medicine.⁴

Two examples of the change of attitude are the health museum incorporated into the new buildings of the Lankenau Hospital in Philadelphia, and more recently the opening of the Hinsdale Health Museum as part of a professional medical center of physicians, dentists, and other allied

⁴ "Taking the Health Message to the Public," *Journal of the American Medical Association*, vol. 167, no. 1, May 3, 1958.

fields. The Dallas Health and Science Museum, before it broadened its scope last year to include other fields of science than human biology and health, was the only other independent health museum in the United States. I suggest that the purposes of a health museum are better served if the emphasis can be shifted from medicine to the whole man. It can be done, I believe, by dealing separately but in an interrelated fashion with man's physical well-being, his mental well-being, and his social well-being along the lines of the World Health Organization.

PHYSICAL WELL-BEING

Try as he will, man cannot escape his basic animalness—his body's requirements for food, oxygen, and the removal of wastes. One responsibility of a health museum is to tell this story in a way that even children can understand. Simple exhibits, working models, specimens, and written and talking labels should be so combined as to convey fundamentals only. There should be no attempt to make a practicing physician of every visitor by including a wealth of technical details. An example will illustrate.

The average health museum visitor has no interest, *per se*, in the mechanics of external and internal respiration. He knows that if he breathes he lives and that if he does not breathe he suffocates and dies. He is aware, too, that he breathes with his lungs and occasionally something goes wrong with the machinery. If he is interested in respiration at all, it is because Uncle George died recently of lung cancer, and he (the visitor) wants to find out whether it might be caused by cigarettes. It is unlikely that anyone can understand tuberculosis, pneumonia, or any other disorder of the respiratory tract without some knowledge of its structure and function. The problem is to attract the visitor to learn the necessary facts. One way is to provide him with signposts that he is familiar with, such as "Miracle Drugs for Tuberculosis." If that story is properly told, the other information will of necessity be included.

Let us realize also that many visitors are well informed. We cannot descend to them by maintaining a constant low level of presentation. Our exhibits should be a balanced mixture that will interest and challenge the educated while at the same time not overwhelm the uninitiated. From time to time we should branch out from a specific body function to some of the integrating principles in biology such as metabolism and osmosis. In short, we should make the health museum such an intriguing place that the man who comes to see what his wife's slipped disk looks like remains to learn about the skeletal system generally, and he does this almost without being aware that a learning process is taking place.

This is not trickery. It is the established principle in education of starting with people at the place where they are and building on their



Fig. 2



Fig. 3



Fig. 4



Fig. 5

Fig. 2. How far can you hear? An exhibit made in the Cleveland Health Museum workshops for the Health Museum at Lankenau Hospital.

Fig. 3. Giant plastic tooth, an installation at the Hall of Health at the Smithsonian Institution. The Cleveland Health Museum has pioneered in the development of plastic models which have been duplicated for other museums.

Fig. 4. Father determines sex. One of the push-button units in the new human heredity exhibit at the Cleveland Health Museum.

Fig. 5. Ceaseless heart. An example of a circulating exhibit for use at professional conventions, health fairs, airports, bank lobbies, and similar locations. This exhibit combines a flashing light with an electronic attachment that simulates the sound of the heart beat.

interest and curiosity. For such a method to succeed in a health museum, it must be done according to a carefully conceived and executed plan, each piece of which fits closely into the next. What the visitor comes out with in the end is a new insight on how his body is put together, how it works, and what can go wrong with it. The museum thus becomes not only the purveyor of facts, but an interpreter. The opposite of this in a *reductio ad absurdum* situation would be to collect in one building (probably for a rental fee to each client as is done at conventions) a series of exhibits from private and public health agencies on various diseases such as that of the heart, cancer, blindness, and a dozen others. It would take an unusually well-trained person to look at all this material and come away with any unified picture. Yet, conceived in a different light, with the proper scope and sequence, much of the same information can be woven into a fabric about man's physical well-being so as to stress the positive or health side rather than the diseased state and to do it in a manner that would be in the most progressive tradition of museum education.

MENTAL WELL-BEING

Man is a rational, thinking creature. He can communicate through spoken and written language. He has a genius for invention ranging from flint arrowheads to the electronic brain. He has his family, his cities, his United Nations. He is skilled and artistic, whether it be in wading stones in a shallow creek or building the Golden Gate Bridge, in beating a hollow log or performing a Mozart symphony. Nowhere in nature has that unique endowment—the human brain—been duplicated. It is the one thing that sets man apart from his fellow creatures. Why, then, not use it in a health museum to make the transition conceptually between the biology of man and his man-ness?

One idea that is being considered at the Cleveland Health Museum is a nervous system three stories high suspended in the stairwell, with a catwalk around the giant brain at the third-floor level. Exhibits explaining the architecture of the nervous system and its functions would be built into a new stair-rail. As a visitor climbed the stairs, he would not only see and study these exhibits, but by pushing a system of buttons a part of the central nervous system involved would light up. There would be no connecting wires; everything would be electronically controlled. A monumental exhibit of these dimensions would probably need no signposts; people would be attracted to it by its sheer size and by the novelty of the accompanying material in a place ordinarily reserved for utilitarian purposes. If signposts were needed, the obvious ones would be about mental health. Besides showing communication within the body, the senses, the functions of the brain, an exhibit such as this would have an

inestimable value for its symbolism. The impact would be enormous for leading the visitor into the exhibits on man's social well-being after an introduction to human biology on the first floor.

SOCIAL WELL-BEING

Man's social well-being is governed by his ability to get along in society. He learns dependence on his parents at an early age, and as he grows older the search for independence in adolescence gives way to the more mature reality of inter-dependence between him and his friends, his community, and his nation.

One contribution a health museum can make in helping people of all ages adjust to their social setting is a sympathetic treatment of the processes of growth and maturing. The first step is prenatal development, which could include some instruction in human genetics. Menstruation, ovulation, fertilization, pregnancy, labor, and other aspects of the reproductive cycle can be dramatically portrayed by the combining of the Dickinson models and many types of exhibits. The young parent, seeking information about his youngsters in their frustrating four's or fascinating five's (to use the title of a film on this subject) could consult the section on childhood. The adolescent would find information, and perhaps some consolation, in the section on adolescence. The older person could gain an understanding of his stage of life and its problems in the part on geriatrics. Thus by depicting the successive stages of life separately but in a related continuum, the health museum can present many facts on physical and mental health and do so in a context that is closely associated with, and at the same time is directly related to, the social interests and responsibilities of the individual.

Another subject that has fascinated me for a long time and one I want to do an exhibit on soon is human engineering. The next time you are in a department store, look at any of the merchandise (it doesn't matter what it is) from the point of view of its design for human use. A table or desk is thirty inches off the floor because that is the most comfortable height for the average adult. A woman's stocking, a man's shoe, a child's dress are sized and shaped the way they are because they are made to fit and be worn on a particular part of the body. The length and diameter of a pot handle are determined by how comfortable it will feel in a woman's hand, and it is often made of non-heat-conducting material so that the lady of the house will not feel discomfort or burn herself when she picks it up.

Medicine, nursing, pharmacy, and other subjects related to the healing arts also fall into place here where they can receive the emphasis they so rightly deserve in a total treatment without absorbing too much space and seeming to be all-pervasive in the museum as a whole.

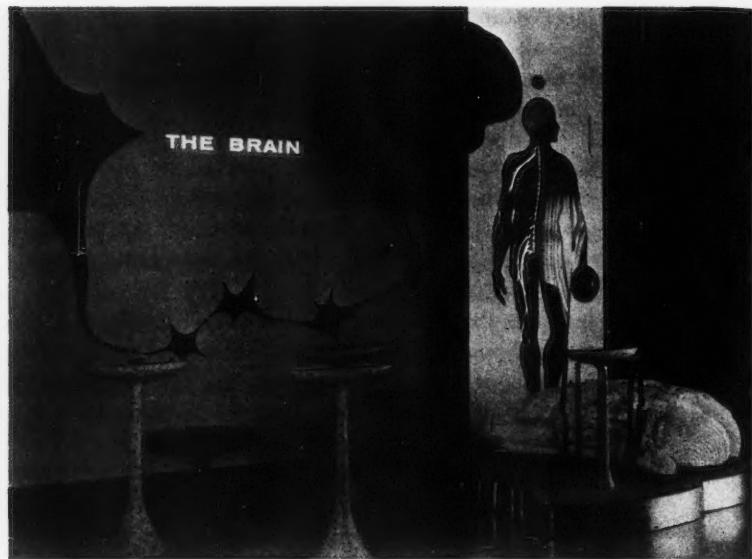


Fig. 6. The brain. An elaborate visitor-participation exhibit at the new Hinsdale Health Museum. Stands in foreground contain earphones for talking labels. Wands on stand at right make contact with several points on the giant model of a brain to light up areas in the vertical panel. The hand in the plastic bubble actually moves.

INTEGRATION OF MATERIALS AND PROGRAM

Having stayed with me up to this point, you probably begin to see ways in which other departments in any established museum could participate in supporting an exhibit program on health.

One of the earliest attempts to display materials about health in any museum in the United States was made at the Smithsonian Institution about thirty years ago.⁵ Like the Hall of Health at the American Museum of Natural History, which antedated the Smithsonian exhibit by some twelve years, it concerned itself with certain phases of public health, such as water supply, disposal of wastes, and so on. It is interesting to note that while both museums pioneered in health subjects, both have dropped their original approaches and have returned to man himself as the central theme in their health exhibits. The Smithsonian's new Hall of Health,

⁵ Lawless, Benjamin W., "Museum Installations of a Semi-Permanent Nature," CURATOR, vol. 1, no. 1, January, 1958.

opened in November, 1957, has taken as its subject, "A Study of Man's Knowledge of His Body—Past and Present," while the American Museum's Hall of the Biology of Man is now in preparation.

One kind of integration, applicable to any kind of museum, is its program. A recent example in Cleveland was with the "Man in Space" exhibit. Our theme was space medicine, and in order to show what problems man will face when he travels and lives in space (weightlessness, cosmic radiations, boredom, and so on) we had to show, first of all, how information about space is gathered, and, second, by what means man will leave and re-enter the earth's atmosphere. This meant displaying a weird assortment of non-medical trappings such as rockets, weather balloons, and even a satellite-tracking station. With the exhibit as the central focus, we scheduled film programs, lectures, and special school lessons. We gave space demonstrations with our transparent woman. One of the local newspapers ran a series of articles on space medicine which were later collected into a pamphlet and distributed free of charge to all visitors. Many outside individuals, organizations, and industries co-operated by providing personnel, equipment, and accessories. Every department of the museum itself became involved. The result was that we have had excellent attendance, good publicity, and one of the most successful projects in our nearly twenty years of operation.

Other areas readily lend themselves to this type of coordinated attack. The health museum can often participate in such programs and from time to time assume the leadership for them. Air pollution, alcoholism, the annual pollen count, diabetes detection, and mass polio vaccinations are a few of the subjects that lend themselves to this kind of cooperation with other health agencies in promoting an awareness of health problems and practices. The health museums, few as they are in number, are not vigorous enough in the integrating and coordinating of their activities with community needs. Until they are, they will not be accepted by their communities as a vital service. Because acceptance by a community is the keynote of fund raising, capital development, and expansion generally, this lack may make the difference between their survival or failure.

It is obvious that I believe in the worth of the health museum. However, it is not without its faults. If trustees and management alike will think ahead, rather than backward to the nineteenth-century European origins from which their institutions sprang, the health museum can flourish in this country. If decisive action is taken to broaden the scope of its subject-matter, to integrate its program within its own organization and the community, and to improve the quality and content of its exhibits, the health museum will prosper. With bold leadership and strong community support, the potential that is the health museum's can develop into a significant contribution to the entire museum movement.

On Art Museum Purchases

GEORGE J. LEE

CURATOR OF ORIENTAL ART, THE BROOKLYN MUSEUM

How does a museum decide what to buy? What basic ideas underlie the purchase of an object? How much weight can be placed on spontaneous reaction—the quick eye and intuitive taste? What other study does a museum undertake before a purchase?

This series of questions deserves more than the stock answer that each purchase is a situation unto itself. It is important that some common ingredients be isolated in this helter-skelter of transactions. Considered philosophically, these purchases characterize, perhaps as much as any other cultural activity, what our society believes should be preserved from the past and the present. While any answer must be incomplete to such complex activities, whatever may be understood is of importance.

The attempt to purchase a new object is an exacting and exciting task for any curator or director.¹ He is seeking for his institution as much basic truth as can be embodied in a single piece. The term "basic truth" here implies more than simple authenticity. It is hoped that the object is endowed with some degree of artistic creativity plus elements suggestive of its own time (*Zeitgeist*). Yet how much of this can really be understood today? Because the object likely comes from another age or culture, the museum man rarely knows as much about it as might be theoretically desirable. He must, nevertheless, consider the piece with some reasonable degree of precision. To examine the interaction of man and object, let us, for the present paper, adopt Stephen Pepper's theory of art objects. How valid such concepts are can be left to the aesthetic philosophers; for this paper, the Pepper theories are admirable tools to use in investigating the relationship between the curator and his potential purchase.

¹ When a director buys for a museum, he has to adopt curatorial methods. Therefore I use the term "curator" throughout this paper. Some of this material was presented in lecture form to the Brooklyn Museum Training Program, December 20, 1956.

Stephen Pepper believes that a work of art has three major aspects.² The first and most obvious is the physical properties of the object, often called the "vehicle." In terms of Western painting this often means simply canvas, pigment, and varnishes. The important thing is that these physical properties remain fairly constant over the years.

The second aspect of a work of art is a series of perceptions. These perceptions are of very brief duration. While they may cover the whole vehicle at once, it is unusual for them to do so. Such perceptions are rather a series of minute impressions, which is particularly obvious in the case of a sculpture that must be seen from many angles, or a piece of architecture that must be experienced from a number of locations. These perceptions are not all of equal value, and most aesthetic theories accept a process called "funding." Funding means primarily an association of past impressions, or ideas, with current impressions, so that one may develop in time a more sophisticated way of looking at an object.

The third aspect of a work of art is the object of criticism. Pepper defines it as "the totality of relevant material based on the perceptions stimulated by an aesthetic vehicle." The significant word here is "relevant." One may perhaps paraphrase this aspect to suggest that the spectator not only has normal sensitive response to a vehicle, but also has a discrimination in totaling up the perceptions. In other words, a work of art needs a competent spectator, and one trusts that the phrase "competent spectator" can, on occasion, be interchangeable with the term "curator."

When a curator visits a dealer, he may see a dozen objects of which one or two can be reserved for future study. This primary selection rests in part on limited perceptions, but it also involves intellectual judgment. Here the curator differentiates his activities from those of the collector who can respond on an emotional basis and buy in short order that which appeals to him. Rarity, for example, means less to a curator, except when it can be used to influence non-specialist action (trustee votes), than to the collector. The contemporary curator differs from his predecessors in the number of objects purchased. In the old days it was customary to buy in seemingly endless duplication. Now a curator rarely selects an example of the type already represented in the collection, unless that piece gives increased meaning to more modest specimens. The objects that the curator selects can parallel the taste or fashionable collecting of his own period, or even oppose it. If rarity, number, and taste are limited factors in curatorial judgment, almost by definition major weight is given to quality. The curator seeks in the main that material

² Stephen C. Pepper: *The Work of Art*, Bloomington, Indiana, 1955. This approach is outlined in chapter 1 and developed in detail in later parts of the book.

which by its quality has meaning to his colleagues, and eventually to the general public. Thus, those pieces that, even on limited first contact, appear to have potential artistic merit are selected by the curator for further study.

Different kinds of evidence enable the curator to reach a decision about the purchase of an object. For discussion purposes one can separate the mental process into three divisions. The first involves aesthetic reactions. A second deals more with intellectual problems; these include the results of scientific examination. Also falling into this second group are various types of cultural evidence. The last division may be called a pragmatic one, for no purchase is made in complete isolation. The concept of a tripartite decision involves a philosophical view of the purchase process, and the divisions indicated are not necessarily chronological to the normal evaluation of an object.

An important element in the aesthetic consideration of the pieces selected by the curator for further study is simply the passage of time. Time enables the curator to build up a series of limited impressions from the objects. Such visual impressions are not equally valid, but those gathered at the end of a few weeks are often more valuable than the earlier ones. This is a simple restatement of the principle of "funding." The curator must, of course, be sensitive in the matter of aesthetic perception, or "funding" will not affect his total judgment of an object. On the other hand, such funded perceptions are inevitably subjective, and therefore the aesthetic decision must be reckoned a relative rather than an absolute one.

When reserved pieces are transferred to a museum for further study, the first action is to investigate them as "vehicles." The curator assuredly has some knowledge of the material from which each object was made and the techniques by which it was fashioned. If a conservator is available to a museum, however, his help at this stage cannot be over-evaluated. Fundamental analyses of the current condition of the objects, and the probable continuance of that condition, derive from technical knowledge. Under these conditions a curator welcomes specialized reports from an experienced conservator.

Other intellectual considerations of an object involve both the specific and the general knowledge of the curator. Specific knowledge implies the investigation of parallel pieces and the stylistic analysis that can be derived from such an investigation. One suggests by general knowledge details of the age in which the object was made and especially those religious and philosophical concepts that account for its making. Such evidence helps the curator reach towards a conclusion on the authenticity of the piece. These intellectual elements are limited, however, just as the visual elements were limited, by the human synthesis. In addition,

II/1 1959

the intellectual and visual approaches do not always dovetail on a single piece. For example, an object the authenticity of which may be reasonably well established in an intellectual way can become under prolonged observation exceedingly dull aesthetically. Or, again, the careful checking of other material can reveal an object several continents away which completely outshines the handsome piece under consideration. It is perhaps fortunate that a third element of decision may also be involved.

The third element in a curatorial decision about the purchase of a single object may be labeled, *faute de mieux*, pragmatic. This section revolves around the concept that no single purchase is made in complete isolation. The curator may be adding distinction to strength already in the collection; he may be patching moderate weakness, or plugging complete gaps. Other pragmatic possibilities include the exhibition quality of the piece, which may differ from its artistic value, as objects of antiquity were not made expressly to be shown in modern museums. Also, opportunism may be reckoned in this division; a given piece simply seems too fine to be turned down in a scarcity market. In general, the curator should try to know how he is building his collection as he weighs each pragmatic element.

The implication that the purchase of museum objects is scarcely an exact science makes one chary of philosophical truisms. Ideally each purchase should involve the "best of its kind." Yet even those curators happily endowed with money and fine collections tend to find that each potential purchase involves some kind of compromise. The limitations implicit in the aesthetic and intellectual study of an object inevitably torment the curator on each purchase. The pragmatic ingredients of the decision help him to retain some vestiges of sanity during purchase decisions. If the curator acts with skill and knowledge, the mistakes he is making will not become evident for years. Even with a theory as flexible as the one indicated above, it may be useful to review a few purchases to illustrate an additional gap between theory and practice. The examples chosen are from recent Oriental activities at Brooklyn with which the author is familiar.

A purchase in 1953 demonstrated some of the principles discussed in this paper. A group of Chinese ceramics came on the market and could be surveyed with care. With the kind cooperation of the dealer, it was possible to reserve two pieces for further consideration. Both were considered examples surviving from the Sung dynasty (tenth to thirteenth centuries in China), and both were called *kuan*, the official ware of Sung. As the pieces were studied in a visual way, it became evident that increasingly greater attention was being paid to a small quatrefoil bowl (Fig. 1). This piece was made of a dark-colored clay and covered with a blue-gray glaze of extreme subtlety of color and sufficient irregularity

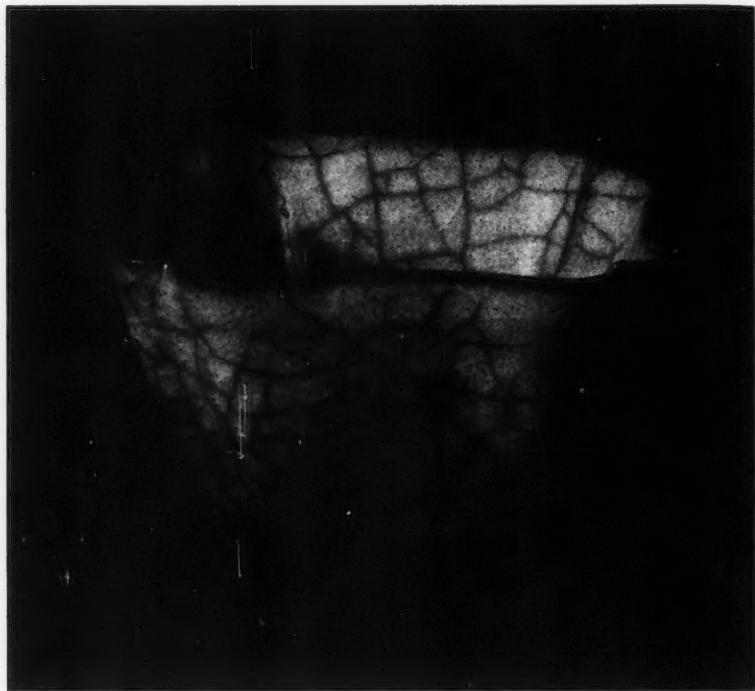


Fig. 1. Quatrefoil bowl, glazed porcelaneous stoneware. China, twelfth to thirteenth centuries A.D.; diameter: two and five-eighths inches; Brooklyn Museum No. 53.51.

of surface to be "soft" to the touch. It also showed the two-toned crackle often found in the *kuan* ware made in South China at Hangchou. Eventually it was decided to concentrate all activity on the small bowl, a decision based mainly on the funding of perceptions.

It was possible to combine a number of types of evidence in studying the quatrefoil bowl. At least one of the *kuan* kiln sites at Hangchou had been recorded by Dr. Manzo Nakao as early as 1930³ and subsequently visited by a number of Oriental scholars. Dozens of documented potsherds from a Hangchou factory that made *kuan* ware had been made available to American scholars. In addition to the inspection of objects by sight with a binocular microscope, and by touch with the knowing hand, a new technique has been developed by Mr. William Young of the Museum of

³ Manzo Nakao, *Tōji [Oriental Ceramics]*, vol. 3, 1930, pp. 1-23.

Fine Arts, Boston, for the study of Oriental glazes.⁴ This consists, roughly, of shooting a controlled beam of light at the piece and taking a photomicrograph of the substructure of the glaze. Mr. Young had just devoted a good deal of time to the *kuan* problem and was kind enough to look at the Brooklyn piece. In addition, he made available for study the documented *kuan* fragments with which he had been working. Both kinds of evidence substantiated a Sung date for the Brooklyn bowl. Another type of checking was completed by the finding of a bowl of similar shape with parallel characteristics in the collection of Sir Percival David.⁵

The literary sources provided somewhat less satisfactory evidence on the problems of *kuan* ware. It is generally believed that the kiln found by Dr. Nakao was one of two *kuan* kilns at Hangzhou and the one located near the Altar of Heaven (*Chiao t'an*). The earliest reference to Altar of Heaven *kuan* seems to occur in a thirteenth-century book which has been preserved in part in a fourteenth-century compendium.⁶ However, the data given there on Altar *kuan* are quite meager, and the description of the wares of other Hangzhou kilns may eventually supplement this scarcely satisfactory passage.⁷

In the case of the *kuan* quatrefoil bowl, the curator could combine kiln site evidence, scientific examination, and at least sparse literary record to form a basis for attribution to the Sung period. The need for such a piece in The Brooklyn Museum was easily demonstrated. The collection already possessed several eighteenth-century copies⁸ of Sung *kuan* ware. A former curator, recognizing the need for a Sung example of this ware, had purchased a small vase in 1936. This piece, while not duplicating the eighteenth-century objects, has been relegated by current scholarship to the seventeenth century. Thus the need for something like the quatrefoil bowl was severe, and the piece, despite minor imperfections in itself and in the knowledge about it, was recommended for purchase.

The other example of museum purchasing to be discussed here is the addition of a Chinese landscape painting to The Brooklyn Museum

⁴ For a first report on this technique, see R. T. Paine, Jr., and W. J. Young, "A Preliminary Report on the Sub-Surface Structure of Glazes of Kuan and Kuan-type Wares," *Far Eastern Ceramic Bulletin*, vol. 3, September, 1953, pp. 2-20.

⁵ R. L. Hobson, *A Catalogue of Chinese Pottery and Porcelain in the Collection of Sir Percival David*, London, 1934, pl. 29.

⁶ The text of the *Fu Hsian Tsa-lu* is preserved in part in the fourteenth-century compendium the *Shuo-Fu*.

⁷ The current lack of interest in the identification of Hangzhou wares other than *kuan* is surprising, because subsidiary kilns are clearly recorded in thirteenth- and fourteenth-century texts.

⁸ These pieces were made "in the manner of" rather than with an intent to deceive, for they bear eighteenth-century marks in underglaze blue.

collection. This purchase was completed in the middle of 1955, but its history extends over a considerable period of time. A brief digression indicates some of the factors that encourage procrastination.

For any Oriental curator the purchase of a Chinese painting is the alpha *and* omega of connoisseurship. One begins with the premise that Chinese painting and writing are interrelated in their use of the brush; thus, those who write have already learned the foundation of painting strokes. In addition, training in painting consists partially in the copying of old masters. The combined result provides each generation with a group skilled in handling the brush and capable of painting in older styles. Under these conditions, it is scarcely surprising that today innumerable copies, and even copies of copies, exist alongside originals. While the Chinese possess a substantial literature documenting their pictures, such records are open to those who read, write, and paint and thus do not deter the creation of more copies. This situation, confusing in itself, has been further complicated by the activities of generations of collectors. These connoisseurs have often juggled the colophons and other data that accompany paintings with considerable whimsy. Thus pictures with distinguished histories may in fact be wholly proper, or may have had parts falsified. Anonymous paintings, both good and bad, have been strengthened by attributions to famous artists, and inscriptions confirming the point generously added at a later time. From this mass of problematic material the curator is obligated to select good Chinese paintings for his institution. It is obvious that if he is to succeed at all, he must with knowledge, instinct, and luck separate "fish eyes from pearls."

The Brooklyn Museum had been looking for a Chinese landscape painting for some years. The departmental holdings in that field were virtually not existent. It was time for a beginning, and, although no purchase had been made by 1955, some pictures had been sent to and seriously considered by the Museum. Then came a quiet offer to cross to Manhattan and to see two Chinese paintings. The viewing was held, and it seemed possible that the search for the first landscape was over. At a second viewing, a few days later, it was decided to give serious consideration to a sixteenth-century Chinese landscape attributed to the artist Ch'ien Ku. The second picture also appeared to have interesting potentialities and has since entered the collection of another museum.

Between the two viewings of the Ch'ien Ku landscape in Manhattan, the painting was shown to a specialist in Chinese seals. Such seals of vermilion pigment were often applied by the artist to his picture, by the literati to their colophons, and by later collectors usually injudiciously to both. In addition, the picture title and the artist's inscription had been translated from the Chinese. Finally, an appended note indicated that,

by use of the Ferguson Index,⁹ references to this picture had been published in two seventeenth-century collection books.

As in the case of the ceramic piece, technical examination was arranged for the landscape within a few days of its arrival in Brooklyn. In general, it was given a clean "bill of health" by the conservator. There were no signs of obvious repainting or patching of paper. By the position of the seals of the artist and of one early collector it was evident to the curator that this was the entire picture, and not, as happens on numerous occasions, merely a fragment of it.

It is already obvious that careful consideration of a Chinese object is hardly a solitary task. In addition to the work of the conservator cited above, and the museum curators still to be mentioned, I am much indebted for other help received in the study of this landscape. Mrs. Lea Kisselgoff, formerly assistant in the Brooklyn Oriental Department, made a preliminary translation of many of the colophons which accompany the picture. And, as is his kindly custom, Dr. Howard Linton opened the facilities of the East Asiatic Library at Columbia University and permitted the basic Sinological work to be done there.

The *Ping Po Chai Tu*, "the picture of the Ping Po¹⁰ Pavilion," is painted in ink and color on paper, some fifty inches long and eleven inches high (a detail is shown in Fig. 2). It bears an inscription written by the artist Ch'ien Ku which dates it in accordance with the year 1556. The picture has been remounted several times, but the introductory characters written by Wang Ku-hsiang seem to be contemporary with it. Then comes the picture, followed in turn by seven poems, presumably composed just after it was painted. The poets include Ch'ien and Wang and two other famous literati. Wang and the two last-mentioned men are not well known.¹¹

The matter of aesthetic reactions to the Ch'ien Ku painting remained an important element during the study of the picture. Nothing disturbed the original impression that it was an excellent example of its school of painting; in fact, it improved with additional viewing. Even the best pictures of its period, however, have not received the aesthetic enthusiasm of certain earlier or later Chinese paintings in America.

The study of the Ping Po landscape divided itself into a number of special tasks. The first involved the reconciling of the picture with other paintings attributed to Ch'ien Ku. This matter could be handled with dispatch, for no fewer than six of his paintings had been illustrated from the former Imperial Collection once housed in the Palace Museum

⁹ J. C. Ferguson, *Li tai chu lu hua mu*, Nanking, 1933.

¹⁰ Brooklyn Museum Collection No. 55.97, Healy, Polhemus, and other funds.

¹¹ In fact the checking of biographical indexes in both English and Chinese has failed to provide any kind of information.

in Peking.¹² One could, for example, identify similar brush work in the depicting of certain trees in this group of Ch'ien Ku paintings.¹³ The handwriting of the artist again could be verified by comparison with the inscribed pictures formerly in the Imperial Collection.

A second problem was to test the Ch'ien Ku picture being considered at Brooklyn against other original paintings. Because few Ch'ien Ku's were to be found in America, it seemed that qualitative judgment on the Ping Po landscape would be helped by comparing it with other pictures of the same time and general school of painting. Accordingly, trips were made to Boston and Washington¹⁴ to examine other paintings of the Wu school, named after a section of the city of Suchou where many of these painters lived. Direct comparisons were obtained by placing the Ch'ien Ku beside the paintings of his friend, Lu Chih.¹⁵ In general, the Ping Po landscape easily survived these quality tests.

The third problem involved clarification of the past history of the Ch'ien Ku picture. One aspect of this delving into collecting history centered around the fact that the hand scroll bore the seals of three Emperors of the Ch'ing Dynasty (seventeenth to twentieth century). The eighteenth-century Emperor Ch'ien Lung published part of an extensive catalogue of the Imperial Collection. The *shih ch'ü pao chi* seal on the Ch'ien Ku picture suggested that it should have been included in the published section of the Imperial Catalogue, but the Ferguson Index failed to record this listing. Mr. Tomita of the Museum of Fine Arts, Boston, was kind enough to help on this problem, and managed to spot the publication of the painting in the Imperial Catalogue.¹⁶ Back in Brooklyn, it was possible to solve another aspect of the past ownership of the picture. The hand scroll was found listed in the publication devoted to the paintings missing from the Imperial Collection.¹⁷ Although the description of the picture there is very brief, sufficient details are given so that the identification could be absolute. On the

¹² *Ku kung shu hua chi*, Peking, 1930-1936. Ch'ien Ku paintings are illustrated in the following volumes: 11, 12, 23, 25, and 31. Also *Ku kung*, Peking, 1929-1936, vol. 23.

¹³ By comparing the Ping Po landscape with the pictures in *Ku kung shu hua chi*, vols. 11 and 23.

¹⁴ I am much indebted to Mr. Kojiro Tomita of the Museum of Fine Arts, Boston, and to Mr. Archibald G. Wenley of the Freer Gallery, Washington, D.C. They not only made available for study the necessary comparative pictures but also kindly examined the Ch'ien Ku painting.

¹⁵ An excellent landscape by Lu Chih is to be found in the William Rockhill Nelson Gallery in Kansas City. As I had seen this picture only a few months before embarking on a study of the Ping Po Pavilion, a trip to Missouri did not seem warranted.

¹⁶ This footnote and the ones that follow are probably of interest only to Orientalists. They mark page 5 of untranslated Chinese texts. *Shih ch'ü pao chi*, composed in 1744, book 39, p. 30a, *Yu shu fang*.

¹⁷ *Ku kung i shu chi shu hua mu lu*, p. 7b.

II/1 1959

other hand, it has not been possible to solve the mystery of why the Ping Po landscape was recorded in the collection of the seventeenth-century connoisseur Kao Shih-chi without bearing his seals. Certain other distinguished paintings in American collections are equally obscure on this matter of Kao ownership. Perhaps all this is for the best, as Kao was a somewhat unreliable official whose paintings were later confiscated by the government, and modern scholarship suggests that some of the pictures with authentic Kao Shih-chi seals were actually copies painted for him.

After the painting had been considered along the lines indicated above, its purchase was recommended to and acted on by the trustees of The Brooklyn Museum. This action reënforced continuing interest in the Ping Po landscape. One new publication supported the attribution to Ch'ien Ku. A 1955 catalogue of the Shanghai Museum illustrated a painting by Wên Chêng-ming, the master and teacher of Ch'ien Ku. This picture, called "The Chen Shang Studio," was similar in general composition to the Ch'ien Ku painting.¹⁸ While the Shanghai painting represented a general landscape type, it was by inscription associated with a particular place, namely, the Chen Shang Studio of Hua Hsia, a collector contemporary with Wên Chêng-ming. This evidence suggested further research into the precise meaning of the Ping Po Pavilion.

¹⁸ *Hua yüan to ying*, vol. 2, fig. 12.

Fig. 2. Detail from the Ping Po Pavilion by Ch'ien Ku. China, dated in accordance with 1556. Painting in ink and color on paper, fifty-one and five-eighths inches by eleven inches; Brooklyn Museum No. 55.97, A. A. Healy, Polhemus, and other funds.



Meanwhile, a Formosa publication of 1956 on the paintings once in the Imperial Collection¹⁹ permitted identification of one previously unread seal on the poems associated with the Ping Po landscape. This seal was applied to overlap the sheets of the poems which followed the picture, and its importance derives from the implication that its user was apparently the first to assemble the poems in their current order. The seal reads "tsé mu t'ing yin" (the seal of the *tsé mu* pavilion),²⁰ and was used by the Ming collector Chu Chih-ch'ih. As he was the first to record a detailed description of the Ch'ien Ku landscape, this identification might have been anticipated.

The last major problem was the subject matter of the landscape, or the precise meaning of "Ping Po Pavilion." To explain the work done or to give in detail the reasons for the ultimate choice would require a separate Sinological essay at least as long as the present paper. It is perhaps sufficient to say that, after some years of frustration, a valuable clue was turned up with the aid of Dr. Chiu of Harvard-Yenching in 1957. This was an account of the life of a Buddhist monk who was called the Ping Po priest, and lived in the Ming Dynasty.²¹ One sentence of this text, plus a happy guess, led to other sources and an eventual tenable conclusion. The Ping Po Pavilion most likely represents a place of seclusion for Hsü Ch'ien of the Yuan dynasty (fourteenth century). As Hsü was a distinguished non-conformist, it is possible that the artist and the writers of the poems purposely covered up the source of their inspiration, and that the political problems of the middle sixteenth century encouraged them to do so.

In a general conclusion about the purchase of Chinese paintings, the need for care cannot be too highly stressed. Visual reactions are of great importance, but many a curator has gone down the primrose path by depending on them. The technique of checking pedigree also has its limitations. At best, pedigree enlarges the painting as an object of criticism, but there is always the possibility that the recorded paintings are copies. In the main, a curator must look continually, check furiously, and lead a somewhat upright life. These careful investigations of Chinese paintings are not for the purpose of "fuss-budgeting" for its own sake or even of demonstrating sublime scholarly technique. Several cases of duplicate paintings have appeared on the American market in recent years. It is obvious that the more ways a painting can be checked the less chance of error. At the same time, no one can say with complete assurance that the task is finished. To put it in more specific terms, there is a chance, perhaps one in a hundred, that there is another Ch'ien

¹⁹ *Ku kung shu hua lu*, vol. 1, p. 118, and vol. 4, p. 189.

²⁰ This is my own reading of the seal and is subject to later revision by specialists.

²¹ *Lieh chao shih chi, jun* book 2, pp. 45a-b.

Ku painting of the Ping Po Pavilion floating around China. It has never been published, and there is nothing in the past history of the Brooklyn picture that suggests a second example exists. But if such a hypothetical painting has been hidden out in China for hundreds of years, then, on the whole, it is quite possible that one curator would be perfectly happy not to hear about it.

CURATOR

PICTURE CREDITS

Pages 12-19, The Metropolitan Museum of Art (Figs. 1-16, 18, 19, William Pons; Fig. 17, Dan Wiener); page 44, Don Rice, *New York Herald Tribune*; pages 75, 79, Cleveland Health Museum; page 82, Hinsdale Health Museum; pages 88, 93, The Brooklyn Museum; all others, The American Museum of Natural History.

XUM

V
2
1

5
9

XUM

s;
9,
he



